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PC review Issue 83

ISSUE 83 JULY 1998 £4.99 US\$13.95

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# PC **review**



## WINDOWS 98 SHOULD YOU UPGRADE?

**FULL  
11-PAGE  
REPORT**

### **Voodoo2 Deathmatch**

Which new 3Dfx card is right for you?

**REVIEW SPECIAL**



### **Orcs in Space?**

The PC Review verdict on StarCraft

### **World Cup Frenzy**

The summer's hot new footy games are all playing for glory!

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# PC review contents

Games, multimedia, hardware, creative software, utilities and the Net. It's all here in PC Review.

## WINDOWS 98

### SHOULD YOU UPGRADE?

024

It's the most important new piece of software this year, and it's here in PC Review! In our whopping 11-page feature we turn Windows 98 inside out, revealing its new features and telling you what they'll do for you. Then we'll answer that all important question: should you upgrade? Follow our advice and you'll make no mistakes.



036

### StarCraft

Warcraft 2 fans have waited a long time for this one, but what the rest of us want to know is if it's more than just orcs in space. Find out as we review *StarCraft*.



086

### Modem Madness

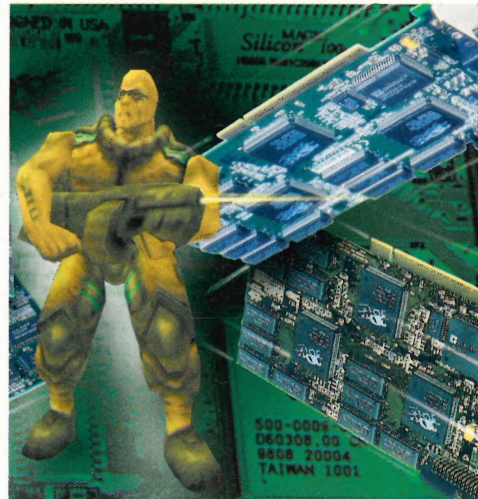
Want to get on the Net? We'll tell you which of the fast new 56Kbps modems is best in our Works section.



075

### Voodoo2 Deathmatch

Nothing will improve your gaming experience quite like a new 3Dfx card. Find out which is best in PC Review.





# issue 83 July 1998

## games review

### 036 STARCRAFT

An amazing strategy fest in space!

### 040 DEATHTRAP DUNGEON

Finally, the one we've been waiting for.

### 042 SPEC OPS

Be a US Army Ranger, if you dare.

### 044 WORLD LEAGUE SOCCER 98

Good enough to score on Seaman?

### 045 WORLD CUP 98

World class action from Electronic Arts.

### 046 THREE LIONS

Roaring, or just purring like a kitten?

### 047 USM 98

Ultimate Soccer Manager 98 is here.

### 048 ARMY MEN

Great idea, what about the gameplay?

### 050 TEAM APACHE

The helicopter you've been waiting to fly.

### 051 COMANCHE GOLD

Another load of bullion from Novalogic?

### 052 CASTROL HONDA

It's the only true bike sim on the PC!

### 053 MONSTER TRUCK MADNESS 2

Big-wheeled bouncing fun from the USA!

## multimedia & the net

Discover the finest CD-ROMs and Internet sites with a section devoted to finding great content. If we don't rate it, it's just not worth your time or cash.

### 068 EYEWITNESS WORLD ATLAS

Dorling Kindersley gets map-tastic!

### 069 BROWSER: THE NEW RELEASES

Godzilla, the Turin Shroud, Macbeth, Nile and the Motion Web site all feature as we browse the latest new sites and CDs.

### 073 ESSENTIAL SITES: TRAVEL

Where do you want to go today?



## the works

### 075 VOODOO2 DEATHMATCH

Four new 3Dfx cards in our grueling tests.

### 078 SURF EXPRESS

Our speedy new utility of the month.

### 079 PAINTER 3D

Paint textures onto 3D models in realtime.

### 080 PHOTOVISTA

Makes 3D panoramas from your photos.

### 081 PICTURE PUBLISHER 8

Photomanipulation at a price you'll like.

### 082 DIGITAL ORCHESTRATOR PRO

How tuneful is this sequencing software?

### 084 EPSON COLOR STYLUS 850

A printer worthy of a king.

### 085 SHAREDWARE

Two users, one PC! How does it work?

### 090 HOW TO... PHOTOVISTA

Make your very own digital panorama.

### 092 HOW TO... MP3

A complete guide to using this new technology to enjoy music on the Net.

## reviews fast find

Army Men	048
Aztech 56K PCI modem	088
Castrol Honda Superbike	052
Comanche Gold	051
Creative 3D Blaster Voodoo2	077
Deathtrap Dungeon	040
Diamond Monster 3D II	076
Diamond SupraExpress 56	087
Digital Orchestrator Pro	082
Dracula	058
Epson Stylus 850 printer	084
Eyewitness World Atlas	068
Hexlore	055
Lasat Safire 560 Voice modem	087
Macbeth	069
Maxi Gamer 3D2	077
Monopoly World Cup	057
Monster Truck Madness 2	055
Multitech MT5600ZDX modem	087
Nile	070
Northern Europe	070
On The Ball 2	056
Orchid Righteous 3D II	077
Ordnance Survey Atlas GB	072
Pace 56 Voice modem	088
Painter 3D	079
PhotoVista	080
Picture Publisher 8	081
Premier MT56Ke modem	087
Project Airos	058
Rising Lands	057
SharedWare	085
Solar System Explorer	071
Spec Ops	042
StarCraft	036
Surf Express	078
Taste of Japan	071
Team Apache	050
Three Lions	046
Total Annihilation add-on	055
Trust Communicator ESP	088
Ubik	056
Ultimate Soccer Manager 98	047
US Robotics Sportster	088
World Cup 98	045
World League Soccer 98	044
Wreckin Crew	055

## regulars

### 006 WELCOME

### 010 UPFRONT: NEWS

### 012 THE GAME CHART

### 018 SPECIAL REPORT

### 022 LETTERS

### 023 COMPETITION

### 055 GAMES ROUNDUP

### 060 REISSUES: BUDGET GAMES

### 062 SOLUTIONS AND TIPS

### 094 SUBSCRIPTIONS

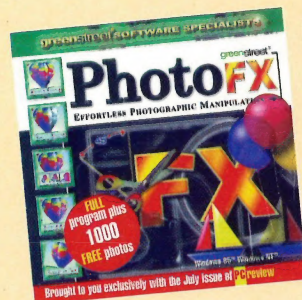
### 096 Q&A HELPLINE

### 100 CLASSIFIED

### 102 CD REVIEW

### 106 NEXT MONTH

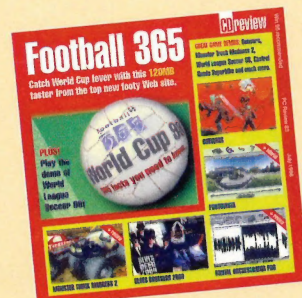
## on your discs



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tutorials page 008

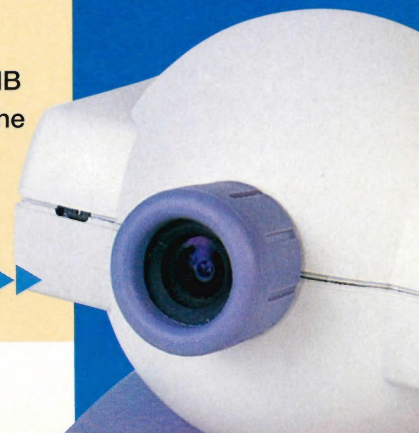


### CD Review

Highlights this month include 120MB of footy facts care of Football365, the Outwars demo and a fully working version of PhotoVista. Aren't we good to you?

further details page 102

Win a Captivator Webcam in our competition. Page 23.





# welcome to PC review

## Notes from the Editor

It's funny how we often refer to PCs as 'machines'. Apart from the disk drives, cooling fan and on-off switch they don't have any moving parts, and their workings are anything but mechanical. More than anything they're electronic devices, and to most of us living in the 20th Century they remain as baffling as steam engines must have seemed to members of 18th Century society.

I think one reason we classify computers as machines is to set them apart from living, thinking beings. User-friendly they may be, but we don't really want to think of PCs as 'human' in any way. They're machines for typing letters. Machines for playing games. Machines for accessing Internet data. They can't think for themselves.

Gradually, though, computer programs are being designed which appear to be able to think. You may have heard recently of an IBM computer called Maven which controversially beat the world's first and second ranked Scrabble players. Elsewhere, neural networks are being developed. Based on the structure of the mammalian brain, these computer programs can – given certain kinds of inputs – learn, reason and formulate behaviour all by themselves.

With the electronic simulation of organic brains continuing apace, and computers being used to model genetic and evolutionary processes, I have a feeling that the fascinating field of artificial life is going to be contributing a lot to computing over the next year. Even so, we'll probably keep on thinking of our PCs as machines for a long time to come.

Bill Gates has often said that he wants to make PCs more human by making Windows more human. He's even talked about giving it the capability to talk and understand the human voice. But I wonder if he's really that sincere in his quest to humanise computers? According to one anecdote, Bill was once asked why he likes computers so much. He answered that he was impressed with them as a child because when he asked them to do something they did it, unlike humans.

With an anti-trust lawsuit to sort out Bill's taking on the biggest machine of all: the US Government (a human machine, ironically). And ponder this. How would Bill feel if some 'smart' new operating system told him that Microsoft was too big and that its monopoly was hurting humans and computers alike, and should be broken. After all, that's a conclusion plenty of intelligent people have reached already and it's one the biggest machine of all may come to as well.

But all this Bill Gates-versus-the-Government business has been quite worrying for myself and the PC Review team. After all, we've devoted our cover and 11 pages of the magazine to Windows 98. If the Feds pull the plug on the launch of the operating system we'll end up looking pretty stupid. As I put the rest of the magazine to bed, and those early covers with that glittering rainbow foil roll off the presses, I'm still having pangs of worry.

As I write this, however, all the signs are that you should be able to get Windows 98 on June 25, and I'm pretty confident you'll find our feature helpful when making the whether-or-when upgrade decision. Once you do get hold of Windows 98, write in and let us know if you like it. We'd love to know what you think. Enjoy the issue, and I hope to see you again next month.

G.G. Webster

Garrick Webster  
Editor  
garrick.webster@futurenet.co.uk

## The journalists



### Garrick Webster – editor

After predicting that France would win the World Cup in the last issue, our resident neutral Canadian has been fielding all sorts of calls from people who disagree. Even some French people seem to have a problem with it, and Webster's Politics degree is evidently of no use to him at all when diplomacy is called for...  
garrick.webster@futurenet.co.uk



### Gary Tipp – deputy editor

Magazines are the death of great literature. Unfortunately this holds doubly true for Gary. When we first met him he used to love reading novels both classic and modern. Working on magazines all day, however, he rarely feels like reading in the after hours. Oh well, there's always football, tennis and cricket.  
gary.tipp@futurenet.co.uk



### Graham Southorn – news editor

Southie's had an eight-year Internet habit that he just can't seem to break. Not that we want him to, he's our Net expert. Just to prove the point he's bought a MiniDisc player which he hopes to plug into his PC and download new tracks to record on MiniDisc from the Internet.  
graham.southorn@futurenet.co.uk



### Mark Ramshaw – games editor

Computer games are more than a passion for Mark, they're a profession. Now he's building his own PC specifically for the purpose of playing games. Mark was therefore doubly disappointed with us when we confiscated his Monster 3D II card for our Voodoo2 Deathmatch on page 75. It would have looked great nestling on his P400's motherboard.



### Mat Broomfield – technical editor

Oddly, Mat's duties this month included climbing hills in Essex. Now we never thought Essex was a hilly county, but apparently it has some fine mounds. Mat was to use the elevation to take some panoramic pictures for his PhotoVista review but to his dismay found the hilltop he chose was covered in trees, which kind of spoiled the view.  
matb@cix.compulink.co.uk



### Tim Cant – review writer

You may remember that Tim authored our music feature for the May 1998 issue. Shortly after the magazine went on sale he got a call from a record boss in Miami and was contracted to remix a track by a group called 187 Hold Down (or something like that). Now we're sure he knows what he's talking about when it comes to PC music.  
tim.cant@mindless.com

## Additional contributors

### Paul Dias – troubleshooter

Moving house proved troublesome for Paul, but not one of your technical questions made him flinch. See what tips he has this month starting on page 96.

### Graham Barlow – writer

Formerly our CD editor, Graham returned to our office this month to surf the Internet for free, tell jokes and show off his new mobile phone. He's a freewheeling genius.

### Simon Pickwick – disc editor

We begged him not to show us his tattoo, and thankfully he obliged. Instead the freelancer revealed another two perfectly formed cover CDs.



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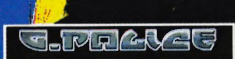
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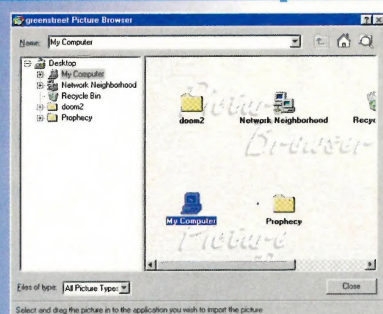
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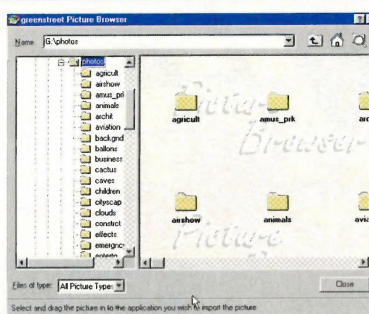




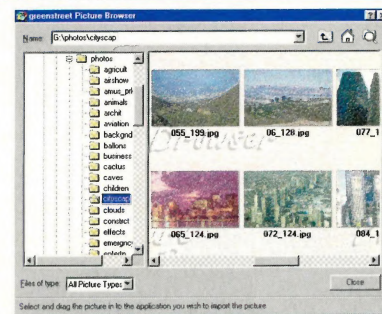
## How to look at the photos on the CD



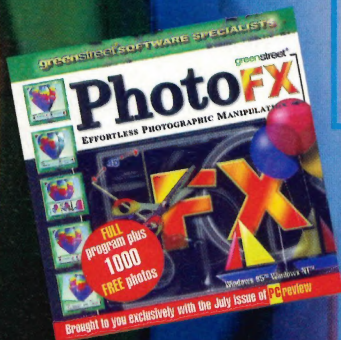
**1** The Picture Browser is a separate program that you can use to look at all the photos on your CD. You can start it by either clicking its icon in the Greenstreet program group, or choosing the Picture Browser option from the File menu.



**2** Locate your CD drive from the different icons available in the left-hand panel. Select the Photos directory. You'll see the different categories appear as folder names. There are 59 different folders in total, arranged alphabetically for your perusal.



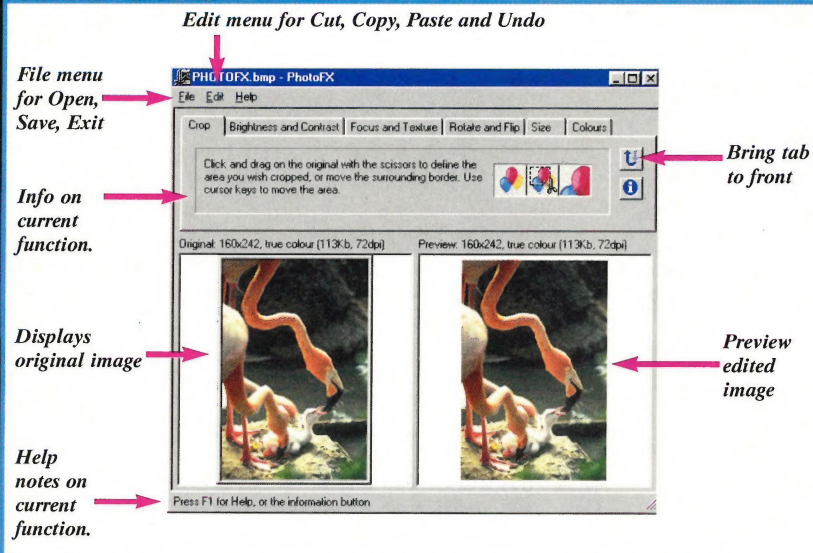
**3** Simply open a folder and thumb-nail previews of all the images contained are displayed. If you want to work on one of the photos, then open up PhotoFX and drag the photo from the Picture Browser into the preview area of PhotoFX.



# PhotoFX

A photo editing package and 1000 photo images for free. **BY GRAHAM BARLOW**

## How PhotoFX works

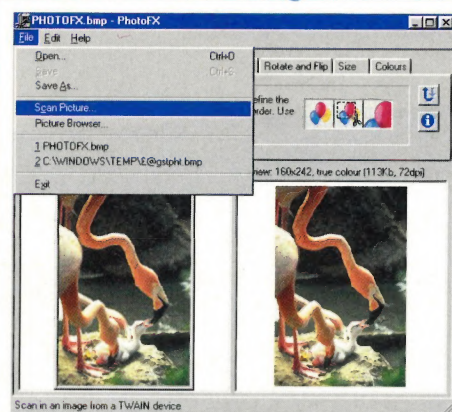


Gone are the days of bookshelf-hogging photo albums. In the digital age, we save space by storing photos on our PCs. Another advantage of the digital medium is that you can manipulate your photos to your heart's content – and the good news is that you're now the proud owner of *PhotoFX* from Greenstreet, just such a program. It comes complete with 1000 photo images for you to practice on or use – royalty-free.

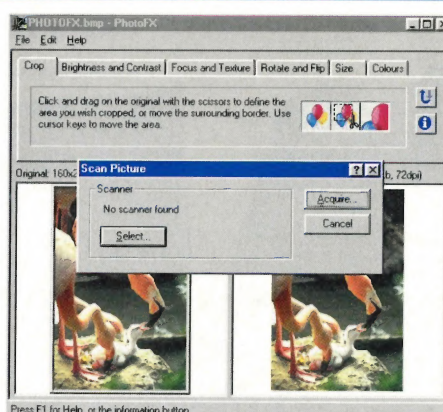
*PhotoFX* always has your original image and your modified version on screen at the same time. This way, you can judge how the changes you make look. There's an impressive array of options available too. You can crop any area, or change the brightness, contrast, focus and texture of the image. If your image is skewed slightly, then the Rotate option will come in useful, and if you want the image flipped around the other way, you can do that too. The Size tab enables you to change the size of the image using either centimetres, inches or pixels. Finally, using the Colour tab, you can reduce the number of colours used or even make it black and white.

So how do you get your images into *PhotoFX*? Well, it's fully compatible with the Windows clipboard, so you can cut and paste images between it and other applications. If you own a scanner, you can scan images directly into *PhotoFX* from the File menu. There's also a photo browser included with *PhotoFX* (it uses a separate program called *Picture Browser*). Once you've found the photo you want, just drag and drop it into *PhotoFX*. **PCR**

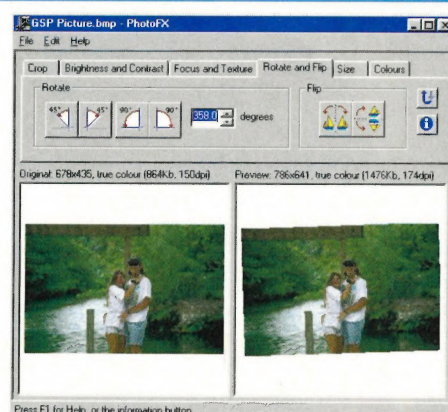
## How to scan an image into PhotoFX



**1** First off, you need a scanner already connected to your system. From the File menu choose Scan Picture and select your default scanner from the Scan Picture dialog box. Hit the Select option to choose a different scanner.



**2** Click the Acquire key to start scanning. If the photo is quite large then expect it to take a while to scan it all in. It may also require a lot of hard drive space for a big picture, so make sure there's plenty available.



**3** If the scan is skewed to one side when it arrives then you can use the Rotate command to re-align it. Click the Rotate and Flip tab, and use the degrees up and down arrows to subtly change the angle of the picture.



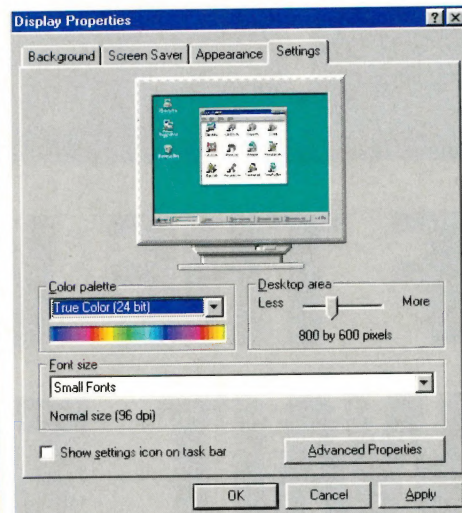
## Royalty-free photos too!

Included with the full version of *PhotoFX*, we also bring you 1000 royalty-free photos to practice your image manipulation skills on. These photos come from a larger collection called *Greenstreet 10,000 Photos*. You can buy the full collection from Software Partners on 01480 466 111 for £9.95. Here's a list of the different categories of photos you'll find on our second CD this month:

Agriculture ■ Airshows ■ Amusement Parks ■ Animals ■ Architecture ■ Aviation ■ Backgrounds ■ Balloons ■ Business ■ Cacti ■ Caves ■ Children ■ Cityscapes ■ Clouds ■ Construction ■ Effects ■ Emergency ■ Entertainment ■ Fireworks ■ Flags ■ Flowers ■ Food ■ Fruit ■ Gardens ■ Holidays ■ Ice ■ Industry ■ Landmarks ■ Landscape ■ Lilies ■ Miscellaneous ■ Mountains ■ Mushrooms ■ Nautical ■ Oceans ■ Old West ■ Parades ■ Parachuters ■ People ■ Plants ■ Racing ■ Recreation ■ Rodeos ■ Sand and Sea ■ Scenic ■ Sports ■ Sunsets ■ Textures ■ Trains ■ Transport ■ Travel ■ Trees ■ Underwater ■ Veggies ■ Water ■ Waterfalls ■ Watersports ■ Winter

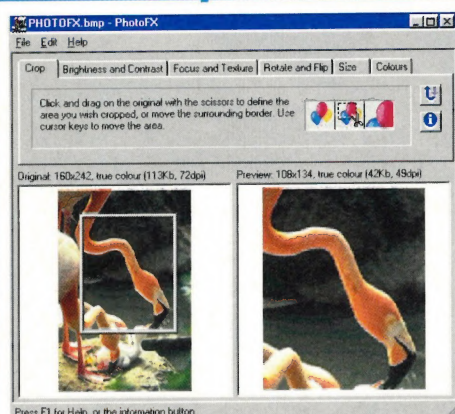
## Windows 95 and PhotoFX

Before you install and run your fantastic free copy of *PhotoFX*, it's a good idea to get Windows 95 set up properly to receive it. Since we're dealing with photo editing, it's a good idea to run Windows in the maximum number of colours. First, right-click on the desktop and select Properties. Choose Settings and, if your graphics card can handle it, select True Colour.

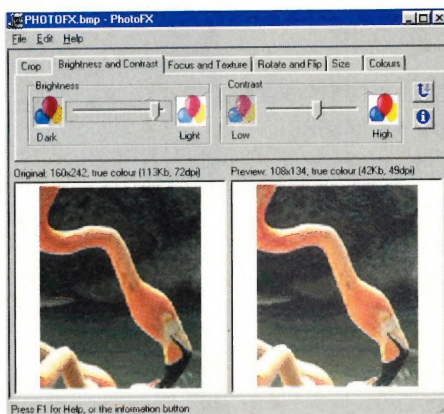


left: It's a good idea to set up Windows 95 properly before running *PhotoFX*.

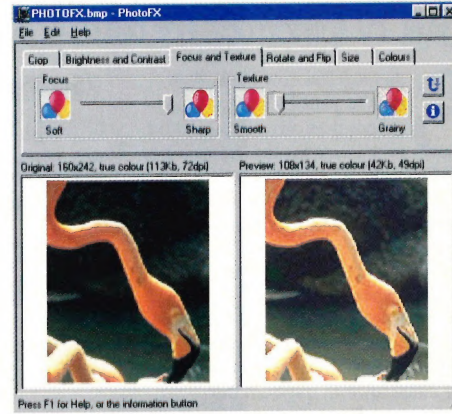
## How to edit a photo



**1** To crop an area of a photo, first click the **Crop** tab. Draw a box using the Scissors cursor on the original image. If you make a mistake, just remember that you can always undo your work using the **Undo** button. The cropped area appears in the right-hand Preview window.

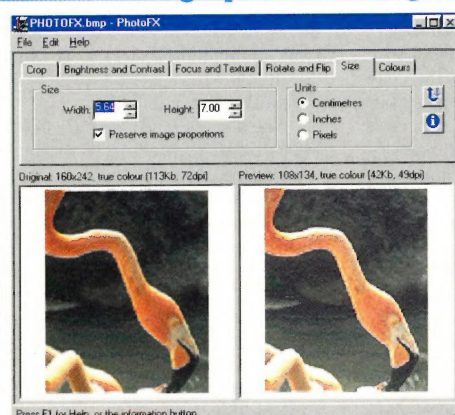


**2** Hit the **Brightness and Contrast** tab. Notice that the original image becomes the cropped image in the Preview window. If you change back to the **Crop** tab, then the original image reverts to the full size. Use the **Brightness** slider to brighten up the image, and use the **Contrast** slider to change the contrast.

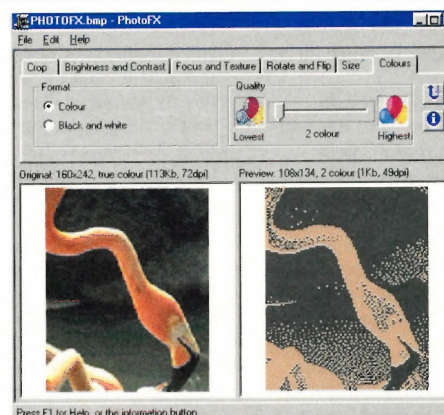


**3** If you've got a photo that's a bit out of focus, then you can use *PhotoFX* to sharpen it up. Hit the **Focus and Texture** tab and use the sliders to adjust the two levels until you get a satisfactory result. Use the **Texture** slider to add a little grain to your photo if you like.

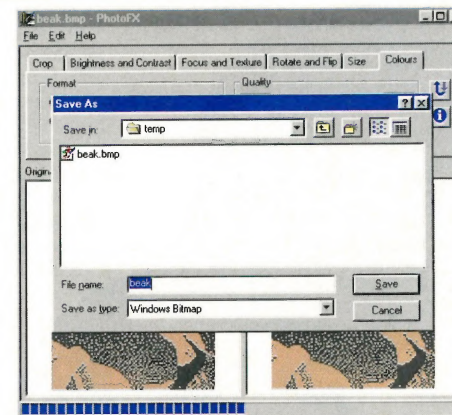
## How to change photo settings



**1** If you've scanned in your photo, then it's possible the photo size takes up too much memory. Using the **Size** tab, you can reduce the amount of memory being used by making the picture smaller. Furthermore, you can also re-size the picture using centimetres, inches or pixels.



**2** You can see the effect of reducing the number of colours used in the image by using the **Colour** slider. If you want to, convert your image to a 256 greyscale palette, then just hit the **Black and White** button. The Preview window enables you to see the results of your actions instantly.



**3** When you've finished making your changes, choose **Save** from the **File** menu to keep a copy of your work. You can then save a copy of your new image in a variety of file formats including the popular **BMP**, **JPG** and **TIFF** formats.



## IN THE NEWS THIS ISSUE

Exciting hardware for the Net	10
The Official GAME chart	12
Surround sound	12
Cyber pets	14
Biometric security	14
3D for the Web	15
Digital photography on-line	15
Interview	16
Beyond PentiumII	19
Outcast	20
Show	21

## up front

The only place to find the latest news from the world of leisure computing

# END OF THE WORLD WIDE WAIT

**Hardware:** Satellites deliver super-fast Net today, digital TV tomorrow. **BY GARRICK WEBSTER**

Satellites can now beam Web sites to your PC at far higher speeds than any other method of delivery for the same cost as an ISDN line into your home.

Today, a satellite system called DirecPC will give you a souped-up Internet connection capable of downloading data 14 times faster than a 28.8Kbps modem. But an even more exciting development will be here within months. Hardware manufacturer Adaptec and satellite owner Eutelsat have come up with a system that translates satellite broadcasts into the same format used on the Net. This will bring not just Web pages but digital TV and a host of other services to your PC.

It will also change the way we access the Web, with some content available directly from the broadcaster, much like television channels. "You will have a menu to pick and choose from, but if you wanted to get something outside of the menu you

**This new satellite system will change the way we access the Web, with some content available directly from the broadcaster, much like television channels**

would still use the modem to access it," says Ettore Leale of Adaptec's Satellite Networking Group.

The system, aptly named Convergence1, is currently on trial at 100 sites in the UK. The first public services are likely to appear by the end of the year. But you don't have to wait for faster Net access via satellite because Easat Antennas' DirecPC system, which was previously sold to businesses, is available right now. To use DirecPC you need a modem and dial-up access to the Net with a Service Provider, plus a receiver card for your PC and a satellite dish mounted on the outside of your house.

The way it works is that you browse the Web in the usual way, with requests sent from your PC to the server containing the page. When you click on an item to download, it's uploaded to the satellite and then beamed down to your PC at a rate of around 400Kbps. That's seven times quicker than the fastest modem and four times faster than an ISDN line.

You'll get the most benefit from DirecPC if you download large audio, video and image files. For example, a 2MB video clip would take only one minute to download from your PC compared with nine minutes at best over a 28.8Kbps modem. There won't



Illustration by Fred Fieber

be any benefit for playing on-line games because their performance is independent of available bandwidth.

The actual cost of a subscription to DirecPC depends on how much data you download per month. You get a specified amount for free, and then pay for any additional data. The startup kit containing dish, card and software costs £499. According to Easat's estimates, running costs are about the same as a standard ISDN line if you download 100MB per month. This is despite the fact that your dial-up modem must be connected to the Internet while you download packets of data, to ensure they're correctly received.

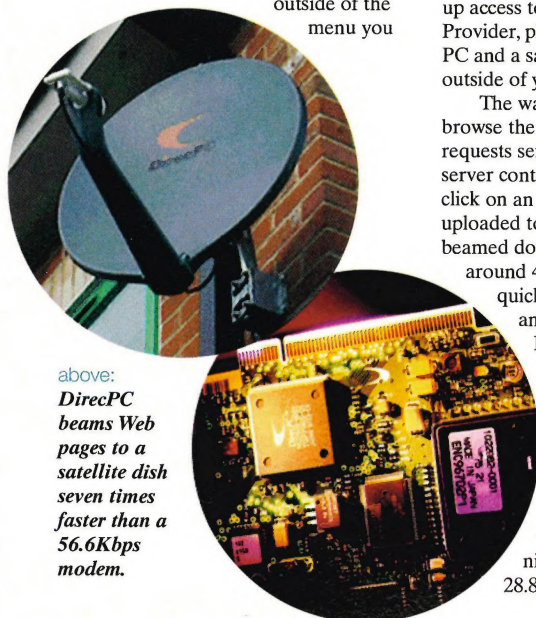
Rival satellite systems, like Convergence1, only require a modem for requesting Web pages that aren't held on the satellite. Since it isn't used for checking data that you download, speeds can be much higher. The Eutelsat system will offer a lightning 45Mbps, which is 800 times quicker than a 56.6Kbps dial-up modem.

The high speeds and DVB (Digital Video Broadcasting) standard on which

the forthcoming satellite services are based will bring not just Web pages but digital television, films, live sports scores, news, weather and stock market quotes as well. The sky really is the limit, although the exact services will depend on what Service Providers and broadcasters intend to offer.

Some services will operate like PointCast and other Internet push technologies, with data being downloaded in the background for you to look at later. The satellite is pouring data to your PC and you will be able to pick and choose whatever you want to look at. It's beaming down information 24 hours a day but you won't have to pay a bill for that connection time," says Adaptec's Leale.

Adaptec will start selling its PC receiver cards in late June, although Internet service providers and broadcasters won't be offering services to the public for another six months. Easynet and BT are participating in the Convergence1 trial so it's a fair bet that they'll be first in line to beam down data to your PC.



above: DirecPC beams Web pages to a satellite dish seven times faster than a 56.6Kbps modem.



# Titanic Adventure

**Multimedia:** Historical CD reveals the true facts behind the tragedy

Following in the churning wake of James Cameron's Oscar-winning movie comes a multimedia title that aims to tell the truth behind Titanic's tragic voyage. In *Titanic - An Interactive Journey* you can guide a

submersible under the sea to view video footage of the wreckage 12,400 feet down. Most revealing is a diary of events that show how the captain ignored warnings of the ice. "The film makers did not always pay attention to the

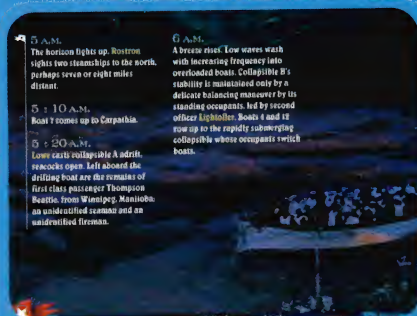
left: *Titanic* boasts 600 period photos and 200 illustrations of the fated luxury liner.

below: Find out what really happened on the fated liner in *Titanic - An Interactive Journey* from Europress.



facts, so *Titanic - Interactive Journey* puts the record straight," says Derek Meakin of Europress.

The £19.99 disc contains 600 photos and 200 illustrations showing what life would have been like aboard the liner, plus 200 photos of recovered objects.



**Hardware:** Detachable joysticks give gamers more freedom of movement

## We have Lift off

cable is 12 feet long, which should be more than adequate unless you get really carried away.

The £79.99 Cyberstik isn't your only choice for free-style gaming. Microsoft is launching SideWinder Freestyle Pro in September, a £50 version of the SideWinder gamepad. Tilting the gamepad left, right, forwards or backwards will steer an object around the screen. It's also proportional (analogue) so that the more you move it, the bigger the effect. Microsoft says that arcade shooting games where you travel through a 3D landscape benefit most because you can control movement by tipping while aiming shots independently with the pad's buttons.

Back in April we reviewed UR Gear, a joystick built into a headset. UR Gear works by transmitting infra red beams between the headset and a receiver mounted on your monitor. After many false starts, perhaps virtual reality gaming is here to stay.



above: The Cyberstik detaches from its base.

below: You can tilt the Microsoft SideWinder Freestyle Pro in mid-air to control games.



How often have you nearly wrenched a joystick from its base to dodge an incoming missile, or score a last-minute goal in *Actua Soccer*?

Joystick abuse could be a thing of the past, thanks to a new breed of sticks and gamepads that give you complete freedom of movement when you're playing games. CyberStik by CyberStuff is a four-button joystick that detaches from its base so you can wave it around in mid-air. A tilt mechanism senses the joystick's movements and transmits them down a cable to your PC. The

## on the net

Why it's worth paying to send your email messages first class



BY GRAHAM SOUTHORN

When you send an email message there's no guarantee how long it will take to reach its destination. It could reach the other side of the world in minutes, hours or sometimes days. On occasion, it might not get there at all.

I can count on the fingers of one hand the number of times that poor Internet reliability has caused me problems. But it's typically those very times when I've been counting on a message to arrive on the same day. I might even be prepared to pay a bit more for an assured level of service, and I'm certain you would too if your livelihood depended on prompt delivery.

That's the thinking behind a research project at Lawrence Berkeley National Laboratory in San Francisco. Scientists there have come up with a system that gives priority to some Internet traffic and not others, just as letters sent by first class post are guaranteed to arrive before those sent with a second class stamp.

Specially-developed software is used to mark prioritised packets of data before they're sent. On their journey across the Internet, the marked packets instruct servers and network routing computers to pass them before other, non-priority traffic. The technology also markedly improves audio and video over the Internet. In tests the scientists sent two video streams from Berkeley to a laboratory in Illinois across a network that was intentionally congested with traffic. The result was startling. The prioritised video played at eight frames per second while the standard clip only played at one frame per second.

The invention of the priority system has already prompted some anguished hand-wringing among some self-styled Internet pundits. It will, they say, lead to a digital underclass unable to pay for the privilege of decent access. This is patent nonsense from people who should know better. I've never heard the same said about second class stamps. Have you?

### news brief

#### 3D monster mash

Now could be the best time to join the ranks of 3D games players, as Diamond Multimedia is bundling two top titles with its Monster 3D II card. EA's *World Cup 98* and *Formula One 97* by Psygnosis will be included with the card in the £239 Monster Sports Pack.

#### Book pages

Yet another bookshop has been launched on the Internet, but The Book People ([www.thebookpeople.co.uk/](http://www.thebookpeople.co.uk/)) at least offers substantial savings. The site guarantees a 50 per cent reduction on high street prices and free delivery within the UK if you order four or more titles. Both fiction and non-fiction books are available.

#### Ready to go

Those of us Brits who are intending to go abroad should tip our hats to Microsoft, which is launching a UK version of its popular Expedia travel Web site in the summer. Americans can already book flights, rent cars and reserve hotel rooms through the US site, which also contains links to travel agents' pages.

#### Higher powers

The day when all telephone calls will be transmitted over the same network, whether they're made from a PC or a regular phone, is one step closer following the sale of Demon Internet. The UK's largest independent Service Provider has been bought by Scottish Telecom, which has no major on-line service of its own.



## The Official GAME

www.game-retail.co.uk

### Top 10 PC Games Chart

#### 1 WORLD CUP 98

In the heat of World Cup fever, *World Cup 98* has shot straight to number one. EA has produced an incredible new soccer extravaganza, which we rated very highly on page 45.

#### 2 FORSAKEN

The 3Dfx accelerated, 360-degree environment of *Forsaken* may make some people queasy, but it has proved popular with an action-hungry audience. We gave it eight out of ten in issue 82.

#### 3 ULTIMATE SOCCER MANAGER 98

The comprehensive update of this stalwart management game shoots straight to number three, leaving the competition standing. We think it's excellent, and you can read the review on page 47.

#### 4 INCOMING

*Incoming* needs a truly ninja PC to run properly, but with the right hardware you'll be treated to the most beautiful combat game around today, bar none. This multi-vehicled shooter earned eight out of ten in last month's PC Review.

#### 5 THREE LIONS

The third of this month's footie related new entries is endorsed by the England team although it's got nothing to do with the Euro 96 anthem by Skinner and Baddiel. For a full review, see page 46.

#### 6 X-FILES UNRESTRICTED ACCESS

All of Mulder and Scully's paranormal adventures are documented in this multimedia info-fest from Fox Interactive. Judging by sales of *Unrestricted Access*, the *X-Files* is still mighty popular.

#### 7 STAR WARS SUPREMACY

Despite falling six places from last month, *Supremacy* is attracting legions of would-be Darth Vaders. This top notch real-time strategy game is highly rated by all at PC Review and earned itself eight out of ten in issue 81.

#### 8 STARCRAFT

Last month's number one has slipped a long way down the charts. But after extensive playing, we rated *StarCraft* among the best games around. See page 36 to see why we awarded it nine out of ten...

#### 9 GRAND THEFT AUTO

*Grand Theft Auto* has smashed its way into the hearts of thousands of PC gamers. It's certainly a lot of fun, and we rated it very highly back in issue 77.

#### 10 QUAKE 2

It might have slid down the charts, but the sound of railgun against cyborg flesh continues to rattle through these offices with alarming frequency.

Produced in association with **GAME** stores. For your nearest outlet visit [www.game-retail.co.uk](http://www.game-retail.co.uk)

**Games:** The surround sound experience is given freedom of movement

# Shake, rattle and roll

below: *Lander* by Psygnosis brings your six-channel Dolby Digital surround sound.

**G**ames featuring Dolby Digital cinema-style surround sound will be released on DVD format later this year.

*Lander* by Psygnosis and Ubi Soft's *Tonic Trouble* will both blow you away with six channels of surround sound and



above: Stop killer vegetables taking over the world in Ubi Soft's *Tonic Trouble*.

special effects when they're released in November. As we reported in our special report on sound last issue, the DVD format enables developers to produce games with six channels of sound, which plays through five regular speakers and a bass. It isn't just music that shifts between the speakers, since events during the game will trigger surround sound effects.

*Lander* is a 3D action game in which you pilot a spaceship around planetary surfaces and underground caves in the solar system. It takes full advantage of DVD to offer real-time lighting and a camera angle with which you can switch between high quality MPEG2 video sequences and the wireframe action.

*Tonic Trouble* is also an action adventure, although it has



considerably more in common with 3D platform games. The star of the game is Ed the Space Shaker, who has inadvertently dropped his cargo of tonic on Earth. Unfortunately the tonic has turned all the vegetables into killers, who try to stop Ed in his quest to get them back. *Tonic Trouble* has 10 levels to explore and animations running at 60 frames per second.

**Software:** Clever code brings digital broadcasts to the desktop

## Radio Head

You could soon receive digital radio broadcasts on your PC for a fraction of the cost of a dedicated receiver. UK company RadioScape has developed software that decodes DAB (Digital Audio Broadcasting) signals, performing most of the work currently done by digital receiver cards. The software breakthrough is expected to accelerate the popularity of DAB by leading to receiver cards that cost around £100.

Apart from CD-quality sound, digital radio has an added benefit for PC owners because pictures and text can be transmitted along with music and speech. The BBC is currently broadcasting experimental audio-only DAB signals, but no firm plans for multimedia radio have been announced.



Digital radio will bring CD-quality sound, pictures and text to your PC.

## international review

Some bizarre PC stories from around the globe

### Washington DC

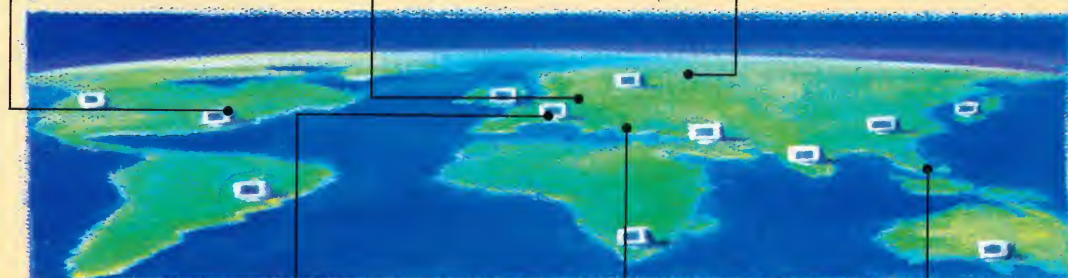
A conference in the US revealed that the first terrorist attack using the Net took place in 1997, when ethnic Tamil guerillas swamped Sri Lankan embassies with email to counter what they saw as government propaganda.

### Berlin

German phonecards, using EPROM chips to store credit data, have become the subject of fraud. Dutch hackers, recharging spent cards with an EPROM writer have found they can be used again, causing losses of \$34 million.

### Moscow

Boris Yeltsin gave his first interview on the Internet, telling the on-line audience that he didn't think Russia should be led by a woman. Yeltsin didn't do his own typing because he has two missing fingers.



### Ireland

Intel has opened Europe's first microprocessor factory to fabricate chips with circuits as small as 0.25 microns. The Fab 14 plant in Ireland cost \$1.3 billion and will be used to manufacture advanced processors.

### Riyadh

Saudi Arabia is to legalise Internet access across the country in June. The government has drawn up regulations for use of the Net and is waiting for applications from companies interested in becoming Service Providers.

### Singapore

The Millennium Bug problem is not being addressed seriously by Asian countries. Software expert Mark Wolfendale found that many managers were ignorant of the Bug, which could cause public services to collapse.



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50 fonts	
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### 10000Photos

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Web Ready  
Professional images from around the world. 110 different categories. Netscape browsing functionality allows you to preview images easily, clearly and quickly.

All Images In Colour

Categories	Sports
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Waterfalls	
002939070643	

### 10000Clipart

Superb Quality Clipart Collection  
Web Ready  
Over 70 artists have contributed to this quality collection resulting in a diverse and comprehensive range of topics and styles. Netscape browsing functionality.

All Images In Colour

Categories	Robots
Hobbies	& Much More
Animals	
002939070657	

### Calendarmaker

The Premium Calendar Maker  
Calendarmaker is an easy to use program which allows you to create yearly, quarterly, monthly, weekly or diary calendar designs. You can use your own images.

All Images In Colour

Content	100 Photos
50 designs	30 Images
50 fonts	
002939070675	

### 2500Toons

Fantastic Quality Toon Clipart  
Web Ready  
A collection of zany cartoons that are full of life. A refreshing change from the more conventional clipart collections. Netscape browsing functionality.

All Images In Colour

Categories	Electrical zaps
Aliens	& Much More
Space dogs	
002939070682	

### 5000Snippets

All The Images You Need and Much Much More  
An outstanding collection of images and fonts to create your own imaginative and individual designs all on one CD-ROM. Netscape browsing functionality. Web Ready

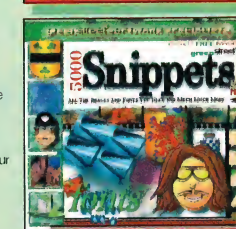
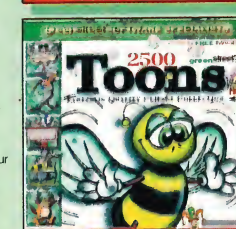
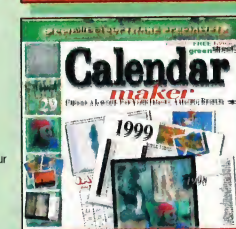
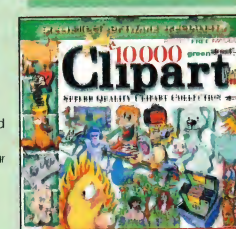
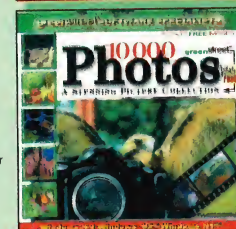
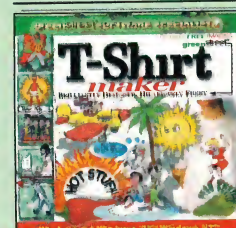
All Images In Colour

Content	Borders
Photos	Coats of arms
Fonts	
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### ROUTEPlanner

The Ultimate Journey Planner  
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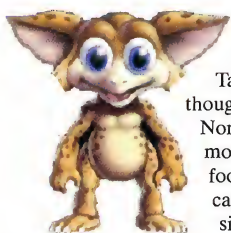




A-life: Creatures 2 is on its way

# Norn's Return

With IBM recently demonstrating a Scrabble-playing computer called Maven, it seems an artificial life (a-life) revival may be on the way. Fitting right in with this trend, Cambridge-based Cyuberlife is soon to release *Creatures 2*, a unique PC entertainment product in which users get to care for highly sophisticated digital pets called Norns.

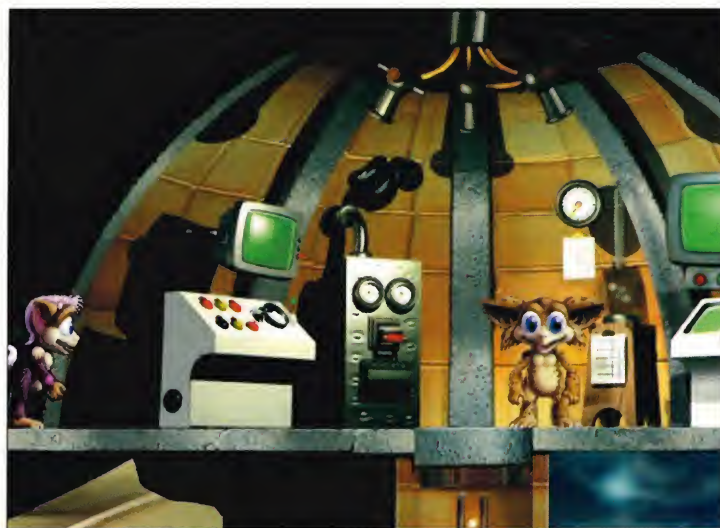


Forget the feeble bleeping of your Tamagotchi, though, because the Norns can do a lot more than demand food, soil their cages and play a silly game. In

*Creatures 2* you have to treat your norns with almost as much care as you would a dog, cat or parrot. The Norns can be taught a language, and you can even encourage them to breed.

If you've ever used the original *Creatures* you'll get the idea. The first version of this a-life disc generated a committed following with half a million copies sold worldwide and led to thousands of users exchanging the Norn eggs they had bred on the Net. With hacks people even genetically engineered super-Norns and users conducted on-line philosophical debates on whether Norns could truly be considered living things. Even evolution guru Richard Dawkins was impressed with *Creatures*.

*Creatures 2* promises more of the same, only now the Norns will be even



above: *Creatures 2*: more sophisticated Norns and high res rendered backgrounds.

more complex with improved neural network brains. While *Creatures* had a static environment in the vivarium, *Creatures 2* will simulate a living ecosystem from which the Norns will

have to get their food and drink. We gave *Creatures* nine out of ten back in October 1996 and are looking forward to *Creatures 2*, which will sell for £39.99 from Mindscape.

Hardware: IBM launches low-cost microprocessors

## More cheap chips



above: Cheap PCs from some suppliers are running IBM's 6x86MX, a competitor to Intel's Celeron

The performance of low-end PCs continues to improve with the launch of cheap processors by IBM.

The 6x86MX PR300 and PR333 chips, which run at speeds of 300MHz and 333MHz respectively, are already being supplied in systems from Time Computers. The chips' low cost enables vendors like Time to sell higher specified PCs, with more RAM and 3D graphics cards, while keeping prices around the £1200 mark.

IBM's chips are a direct competitor to Intel's cheap Celeron processor, which runs at

266MHz. But upgrading from IBM to a PentiumII won't be possible because the 6x86MX range slot into Socket 7 motherboards. In contrast, the Pentium II and Celeron only fit Intel's Slot 1 design.

PC prices could go even lower in future. Manufacturing giant Packard Bell recently announced that it would use Cyrix MediaGX chips to produce PCs costing \$600 in the US. The MediaGX is a complete system on one chip because it integrates all components apart from the main memory, making it cheaper to produce than other designs.

Hardware: Passwords are replaced with the human body

## The eyes have it

Forget passwords. At least, that's what we'll be able to do when plans by IBM, Compaq and Microsoft come to fruition. The three companies are part of a group that aims to make biometric technologies, such as fingerprint, voice and eye recognition, commonly incorporated in PC software and in use by on-line shops and banks.

Major credit card companies are said to be totally convinced that this is the way we'll ultimately buy things over the Internet. "Biometrics holds the ultimate security key to future payment systems," says MasterCard's spokesman, Joel Lisker.

The biometrics standard will ensure that any hardware and software you buy will be compatible. Developers will be able to manufacture applications and peripherals when it's published later this year, which means the first products will appear some time in 1999.

## PC review essentials

The games, multimedia, hardware creativity software you shouldn't be without

### STAR WARS SUPREMACY

We loved this because it's a first-rate strategy battle game set in George Lucas' science fiction universe. "The game is based around the technology, situations, heroes and villains of those landmark movies." Reviewed issue 81.

From: Virgin  
Price: £39.99  
Contact: 0171 368 2255



### CEREMONY OF INNOCENCE

Multimedia was entering its death throes when along came *Ceremony of Innocence* to give it the kiss of life. It's a haunting love story told through interactive postcards. Smitten, we gave it nine in issue 81.

From: Real World  
Price: £24.99  
Contact: <http://realworld.on.net>



### RAY DREAM 3D

We gave this 3D modelling software nine out of ten in issue 80. "You can create objects, add scenery and lighting, change surface properties and do just about everything else without taking your hand from the mouse."

From: Metacreations  
Price: £117  
Contact: 0181 200 8282



### IMAGEWAVE SCANNER

Imagewave is one of the best budget flatbed scanners. It connects to your PC via the parallel port and scans documents up to A4 size at an optical resolution of 600x300 dots per inch. Reviewed in issue 81.

From: Gravinios  
Price: £99  
Contact: 0800 838 437





# PC Nightmares

Mishap and misfortune are what this column thrives upon

## MODEMS, WHO NEEDS 'EM?

According to research by data firm Understanding and Solutions, there are around 15 million PCs equipped with modems in Europe. Yet only just over half of these modems are connected to the Net. Could it be that connection costs in this great union of states are too high, or is the Internet not interesting enough to attract half its potential users?

## REAL LIFE IDIOT

A user phones the tech support line of PC manufacturer Mertec and says his PC won't work. When asked if it's plugged in he says, "I don't know, I can't see behind the desk, it's too dark." Tech support advises him to turn on a light, to which he replies, "I can't we've had a power cut." And that's a true story.

## RAM MALFUNCTIONS

Chips can be worth more than their weight in gold and with 100MHz bus speeds PCs require faster RAM. Some industry experts estimate, however, that up to 25 per cent of the RAM being slotted into the new boards is actually meant for 66MHz buses and has been overclocked to a frequency at which it was not designed to work. RAM faults are becoming increasingly common, so buy from a reputable dealer.



## YOUR PC IS STONED

A virus has been circulating that produces an odd new message. The Stoned-Marijuana virus infects the boot sectors of floppies and the file allocation table of hard disks. The virus periodically produces the message: "Your PC is Stoned. Legalise Marijuana." It's believed the virus originated in New Zealand and that the *Independent on Sunday* has nothing whatsoever to do with it.

## KILLER NET

Lambasted in the daily papers for its wildly inaccurate portrayal of student life, Lynda la Plante's *Killer Net* series was somewhat lacking in the way it treated PC users as well. Flakey, sex-mad, Brighton-dwellers with a shaky grip on reality. We can't be all these things at once. What an awful TV program.

Have you had a PC Nightmare? Send it in to PC Review Nightmares, 30 Monmouth Street, Bath, BA1 2BW. Or, email [pcreview@futurenet.co.uk](mailto:pcreview@futurenet.co.uk).

Internet: The 3D web revolution starts here

# Carry on streaming



Downloading audio, video and animation will soon be a thing of the past, thanks to innovative new ways of streaming data over the Net. A Streamed file is sent live over the Net in a continuous trickle rather than being saved on your hard disk. You've probably played audio and video clips using Real Networks' popular *Real Player* software. Now the company has come up with a new player – *RealSystem G2*, which promises better quality music and several new features.

Most significantly, G2 will play audio and video that's virtually free from interruptions, even when there are severe holdups on the Net. It does this by adjusting the bandwidth whenever the going gets rough, so although the quality of video you're watching may deteriorate it won't stop playing. It can deliver more multimedia too, so you'll see several layers of video, still pictures, scrolling text subtitles and transition effects between different media. Even better for PentiumII owners is that video looks much smoother on high-end PCs, owing to the speed with which they're able to process the video.



above: You can rotate the 3D models like this dinosaur head at [www.metastream.com/](http://www.metastream.com/)

You can now get 3D models streamed live to your PC, courtesy of Intel and MetaCreation's MetaStream format. The 3D model appears the moment you click the mouse, and the detail is filled in as it downloads. At the moment only demonstration files models can be viewed and manipulated but it won't be long before we'll see on-line shops with 3D goods, interactive games and other applications.



left: RealSystem G2 plays layers of video, text and pictures live over the Internet.

## news brief

### Chip for a day

The microchip is explored in a new book funded by Intel. *One Digital Day: How The Microchip Is Changing Our World* shows how computers are used around the world and features Brits like Prof. Stephen Hawking, who uses a notebook PC to run his voice synthesiser software.

### Nightmare in 3D

The 3D horror action game *Nightmare Creatures* is being re-released by Activision in July. It scored a highly commendable eight out of ten back in issue 80, but only worked with a Power VR-based 3D card. The new version will shock everybody because it supports a whole range of different hardware.

### Games on TV

For people who think that bigger is always better comes the VGA-2-PAL card for displaying your PC games on your living room television. The card converts a 640x480 display from most graphics cards, including 3Dfx, into a PAL TV signal, and you can also play audio through a HiFi. The VGA-2-PAL costs £69.

### Good luck England

Show your support for the boys with a badge on your Web site. The Good Luck England World Cup badge is available to anyone who registers at the HouseWeb's World Cup site at [www.houseweb.co.uk/wc.html](http://www.houseweb.co.uk/wc.html). HouseWeb hopes to prove that England's fans are the most passionate about their team.

Internet: Digital photography goes on-line

# Picture This

Digital photography is making increasing use of the Internet for storing and delivering pictures. You've previously been able to store photos in on-line albums, but Sony's new ImageStation Web site goes a step further enabling you to upload pictures from your PC.

You can store up to 50 shots on ImageStation in an on-line photograph album for friends and family to browse, download or send as postcards. Keeping the album will cost you \$19.95 for one year. The

site will also have a shop where you can buy merchandise emblazoned with your favourite photos.

ImageStation also enables American users to send normal photographs by post, which will then be digitised so they can download them later. A rival service by Kodak and AOL is also only available in America but we think it's only a matter of time before it takes off over here. *You've Got Pictures* enables you to have your photographs sent by email to your

Choose a size:

Small

Medium

Large



left: Upload your pictures to on-line photo albums on the PhotoNet Web site.

AOL account within 48 hours of taking a conventional film to a shop to be developed.

AOL members will also be able to

order reprints and enlargements. AOL in the UK told PC Review that there were no immediate plans to introduce the service over here.



# BILL ROPER

Top game  
designer  
speaks!

**Interview:** The big boss from Blizzard tells us how StarCraft got the balance right. **BY GARY TIPP**

**B**ill Roper is passionate about playing games and at his place of work, California-based Blizzard Entertainment, he's not alone.

This is a company run by games players. With the much-loved *WarCraft II* and *Diablo* already on the CV, he spent some time talking to PC Review about the latest labour of love in his life, *StarCraft*. And, boy – can Bill talk...

There are over 50 real-time strategy games available in an over-saturated market. Why is *StarCraft* so special? A huge number of things. And I'll throw a few big ones at you. First up, the three unique alien species. The Terrans, Zerg and Protoss all play very differently from each other with vastly differing technologies and strategies.

The Campaign Editor is the best I've ever seen and it's amazing what you can do with it. This extends the life of the game and all sorts of maps and campaigns can be created.

Finally, the single-player campaign does a great job of involving you in the storyline and driving you through the game. More than any other game we've done to this point, it really unravels the story through the gameplay.

You've mentioned the three alien races. Just how much work was it to get the balance right? Lots (laughs loudly). It was an immense amount of work. The Beta Test helped a real lot. Making sure everything we wanted to get in the game is included would have taken us months longer without having 1500 people playing it. With this number it soon became pretty obvious when there was a bug or an unbalanced strategy. We knew when we went into it that having three unique species was going to be the single most difficult thing about developing the game. And, boy, were we right.

How do you answer the much-banded claim that *StarCraft* is simply *WarCraft II* in Space?

I guess the main reason people might say that is because *StarCraft* isn't 3D. Now that there's been two real-time strategy games with 3D (*Total Annihilation* and *Dark Reign*) there's a camp which says 'I'll never play another 2D game again and if it's not 3D it sucks.' It's just an easy thing to say. But I think the people making the claim should go back to playing *Warcraft* and then play *StarCraft*. It's very different. We know we've got a unique game. In *WarCraft* people used to choose what side they played due to a goofy voice or a particular spell they liked. But nobody got really rabid about which race was the strongest. *StarCraft* is real different and just about everybody has an opinion on which race is the best.



above: Bill Roper from Blizzard Entertainment studiously ponders the next leap in real-time strategy gaming.

**"Somebody said  
wouldn't it be cool if you  
bought a game, go to  
play it multiplayer and  
there's this one button  
you click that takes you  
to an on-line service,  
where you can play for  
free. Our eyes lit up."**



above: Will Bill be this happy when he reads our *StarCraft* review on page 36?

The release of the game was significantly delayed. Why was this and do you think the length of delay has damaged the success of *StarCraft* in any way?

The main reason for the delay was something I've touched on before – namely balance. It took an awful long time to get it just right. Could we have released it at Christmas? Yeah, maybe. Would it have been anywhere near the game it is now? No. We were totally committed to making sure everything we wanted to get in the game is included. Believe me, Blizzard is dedicated to releasing the game as perfect and close to its original vision as it can. It's the way we work.

I look at it like this. If I've been waiting for a game for a year and half, I'd rather wait an extra month and get it bug-free. Also, if it's not part of your plan ahead of time, you just can't dump an additional feature in. It just doesn't work that way and Blizzard has always resisted the temptation.

I'm sure the delays will not kill *StarCraft*. First and foremost, the game is really, really fun and this will carry it through. The delays truly made it a better product. Believe me!

How important does Blizzard Entertainment perceive the storyline to be in a game?

Very. Personally, I was disappointed with *Diablo*, in as much as, before the release we didn't get much of the storyline out with the product. In *War2* it is represented fairly well but only with the voice-over and text, whereas in *StarCraft* the storyline aspects really involve you and as you go through the game the plot twists keep revealing themselves. We try very hard to build deep, rich worlds for you to play in.

Do you think *Starcraft* has made any real advances in pushing the RTS-technological envelope?

Yeah, and more than people first realise when they play it. A lot of the innovations are not designed to hit you over the head. I really believe that having the three species is a real big innovation and that no other RTS has done that as well as *StarCraft*.

What's the deal with Battle.Net? Are you planning a server for the UK?

The concept for Battle.net first came up when we were working on *Diablo*. We knew the big buzz was Internet multi-player gaming. Somebody said wouldn't it be cool if you bought a game, you go to play a multi-player game and there's this one button you click that takes you to a free on-line service where you can play an opponent anywhere in the world for free? Our eyes soon lit up and out of that concept came Battle.net. To date it has registered two million unique users and it's easily the single largest on-line gaming network. It's been a huge success and, yep, there's plans to expand the networks of servers in Europe. Hopefully we'll get something going here in the UK soon.

Where do you see real time strategy games going in the future?

I think for the near future it's definitely not a genre that's going to get any smaller. The real challenge is to be seen as to where you can take the genre. I think there's only so much you can do with the current model and *Starcraft* is getting near that pinnacle. And so we all eagerly await the next generation of real-time strategies.

What do you think will be the most important piece of PC technology over the next five to ten years?

I would say there are three things I'm looking forward to in the next five years. The first is improved Internet connectivity. As the developer this is out of our hands to a certain extent and you can only do so much to reduce how lag times affect your game and make them lag tolerant. Over the next five years, we'll see improved Internet connectivity, not only in availability and pricing, but also in the amount of data we can push through to end users. This will have a huge impact on multi-player Internet gaming.

Also DVD has the potential to up the standard as far as presentation is concerned. You'll no longer need five discs to put your game on. DVD videostreaming technology will mean you can have cooler cinematics and that you'll play smoother and faster.

Finally 3D acceleration. Once a standard gets reached it will do an awful lot for how a game looks and feels. **PCB**



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# BEYOND PENTIUM II

Hardware: With memories of MMX, we look at the future of PentiumII. BY GARRICK WEBSTER

Being a PC fanatic isn't easy. In fact, it can be a downright painful hobby, particularly from a financial point of view. Every time you go out and buy a new PC, you end up with mixed feelings. It's thrilling to see your brand-new monster eating the most demanding new games for breakfast, before snacking on Windows 95. But a week later your head drops as you look in the paper to see £300 has been knocked off the price of the model you bought and it now ships with a 19-inch monitor. Then the new issue of *PC Review* arrives in your local newsagent telling you your chip will be superseded in six months by something twice as powerful with heaps of special features to boot.

Case in point: the launch of MMX. After introducing the Pentium through 1995 and 96, early in 1997 Intel released a variation on the Pentium architecture called MMX. Many users who'd bought a new Pentium for Christmas in 1996 felt wholly cheated when, right after Christmas, the new processor appeared on the market.

With PentiumII now taking over from Pentium, Intel is already well

down the development road towards a new chip. Codenamed Katmai, the upcoming processor is expected by June 1999. Similar to MMX, Katmai is a variant of the PentiumII, with new special instructions built in.

The MMX chip came with special instructions too. There were 57 of them to be precise, all designed to be used by programmers when creating multimedia applications. Many of the new instructions involved 2D graphics or video playback. Others dealt with sound. All, however, were designed for integer-based operations.

## Whole new ballgame

Katmai is different. This chip brings with it a further 70 special instructions, many of which deal with geometric rather than integer functions. Geometric processing is what's required by 3D applications. Every 3D model is made of triangles, the points of which are calculated in 3D space. Whenever the object moves, every point on every polygon has to be recalculated to its new X, Y and Z positions. This is a complex process, but if special instructions are available for the most

commonly used 3D functions, the people who program 3D games and applications might have an easier time and should be able to squeeze more out of the chip.

Also called MMX2, or Son of MMX, Katmai's 70 new instructions come in addition to the 57 that arrived with MMX, which are now built into the PentiumII architecture. As with MMX, they use a Single Instruction Multiple Data (SIMD) technique. This means that the chip can perform two or more commonly repeated functions in parallel during a single processing cycle, rather than executing them one at a time. This increases the chip's efficiency.

## How do you perform?

It's hard to judge at the moment what kind of performance boost Katmai will bring. Intel claimed on launch that MMX could improve speeds by 50 to 400 per cent with certain applications. In reality, we estimate an MMX Pentium generally runs around ten per cent faster than a vanilla one of the same clock speed. Scrolling around a large image was quicker, and some video played more smoothly – but most of the time, the MMX enhancement was hard to detect.

Though Intel is working with over 100 software companies around the world, and spending millions of dollars on Katmai, the company remains guarded when it comes to talking about the chip. No details on performance have been released and the other chip makers are, understandably, being kept at a distance.

A lot will happen between now and the launch of Katmai. Here at *PC Review*, we've just acquired the current top-of-the-range machine in the form of a 400MHz PentiumII by Merteck. While this brings jaw-droppingly fast performance to our office, it's already

**Codenamed Katmai, the upcoming processor is due by June 1999. Similar to MMX, Katmai is a variant of the PentiumII, with new special instructions built in.**



## The competitive edge





## first looks

The greatest upcoming games column ever!  
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been put in the shade. Last month Intel demonstrated a PentiumII running at 700MHz. We reckon such systems will be on the market as soon as this Christmas, if not early in 1999 – just before Katmai. Meanwhile, Intel has announced plans to release faster versions of its Celeron processor to be used in low cost PCs. Celeron is essentially the same as a PentiumII chip but doesn't have the same Level 2 RAM cache. Upcoming Celerons will be released with a small amount of Level 2 cache, but still won't have PentiumII level performance or pricing.

If you're considering buying a new PC between now and the end of the year, do take Katmai into account. You may want to keep your current PC alive a few months longer, into 99, then take satisfaction in having the latest and greatest when Katmai comes about. However, if Katmai is to the PentiumII what MMX was to the regular Pentium, don't expect fireworks. We've still got a plain old Pentium running in our office and it's used for games, Web browsing, word processing and even the odd bit of image manipulation. Having MMX doesn't make a tremendous difference.

### All change at junction 64

Beyond Katmai we can expect big changes. Changes, indeed, that will have a major impact on the computing industry. At the end of 1999, Intel hopes to unveil another new chip codenamed

Merced. Merced will have the Katmai instructions built in, but is an entirely new generation chip. Since the 386, Intel processors have been structured on a 32-bit architecture. Even the most powerful PentiumII is built on the 32-bit foundation laid 13 years ago with the first 386.

The Merced will be 64-bit silicon and will use a technology called Explicitly Parallel Instruction Computing (EPIC). This enables it to use a massively increased number of registers to execute functions in parallel. Often, program code has branches in it which require the chip to seek out certain conditions later on in the program, and then react to them.

Contemporary chips will try to predict which branch in the code will satisfy the conditions. If it takes the wrong route, it has to go back and try again. The Merced will use its extra capacity to run up to 64 entire branches at once, junking the results from the ones that fail and carrying on from the one that succeeds.

Initially, Merced will be for number crunching and business servers – and all of this means that it's not really worth including the chip in your current upgrade plans. At the moment, Intel maintains that Merced will not find its way into desktop machines in the foreseeable future. But then again, the future's never far away in computing.

PCB

Intel may be market leader, but competitor AMD has other designs. The company has developed a technology called 3DNow!, which is part of its new K6-2 processor. AMD has claimed that 3DNow! will be everything MMX2 will be, but a lot earlier. This is a bold boast. K6-2 is set to include 24 special instructions for 3D graphics, whereas Intel's Katmai brings 70. It will, however, be available from this summer, while Katmai will only be available sometime before June 1999. The K6-2 will be a Socket 7 chip (not Slot 1 like PentiumIIs) that fits new 100MHz front-side bus motherboards with AGP. Though it may not dent Intel's market much, 3DNow! will be supported under DirectX6. This means that makers of 3D games will be able to utilise its new power with no additional effort through the Microsoft programming interface.

left: The K6 already has Intel's 57 MMX instructions on board, but K6-2 will add 24 new ones for heightened 3D performance.

### Expendable

Similar to *Spec Ops* (see page 42), *Expendable* comes from Rage, the company who made *Incoming*. Full of fantastic 3D explosions and lighting effects, the game is strictly focused on action, thrills and an arcade feel. Leading a unit of space commandos, your task is to kill alien scum. Due October.



### International Cricket Captain

Here, you can manage county or international sides, giving instructions as you want. Real cricket world stats are used for the simulation, and there's professional commentary from the BBC too. Due this month.



### X-COM

*Interceptor*  
Following *X-COM Apocalypse*, the battle resumes – this time in a high-tech craft. You need strategy and management skills to sort out your alien attackers once and for all. Due July.



**WarCraft Adventures**  
Following *StarCraft* (see page 36) Blizzard Software brings you *WarCraft Adventures*. All the peculiarities of *WarCraft* are recreated in the graphic format, with celebrity voices to boot – you guide a young orc on a quest to re-unite orcish clans. Due August.

### Tiger 99

The PGA Player of the Year for 1997, and possibly the world's most popular golfer, Tiger Woods, has put his moniker to the next PGA Tour golf game from EA. Tiger's one of nine pros to appear in the game playing under your control at courses like Pebble Beach Links. Internet play will add to the interest. Due September.





# WORLD WITHOUT CORNERS

**Preview: Outcast is a game that's all set to buck the 3D trend.** BY GARRICK WEBSTER

**A**lmost every action game currently enjoying popularity employs a polygon-based 3D engine to create its escapist environment. Whether it's the angular caverns where Lara goes tomb-raiding, or the blocky labyrinths of *Quake 2*, chambers constructed from hundreds of smaller solid shapes are the norm. And so it is with the characters who populate these worlds. Even the square-jawed footballers in *Actua Soccer 2* resemble polygonal Frankensteins. As ever more complex scenes creep into games, so we shall bear witness the rise of the 3D accelerator card to handle the perpetuating polygons.

It's taken a little-known software house in Belgium, Appeal, to demonstrate the alternatives. This September, in conjunction with publisher Infogrames, Appeal will be unveiling *Outcast*. Featuring rugged hero Cutter Slade, the game will throw you, *Stargate*-like, into a parallel dimension. And it's a parallel dimension that's created from 3D voxels rather than polygon models.

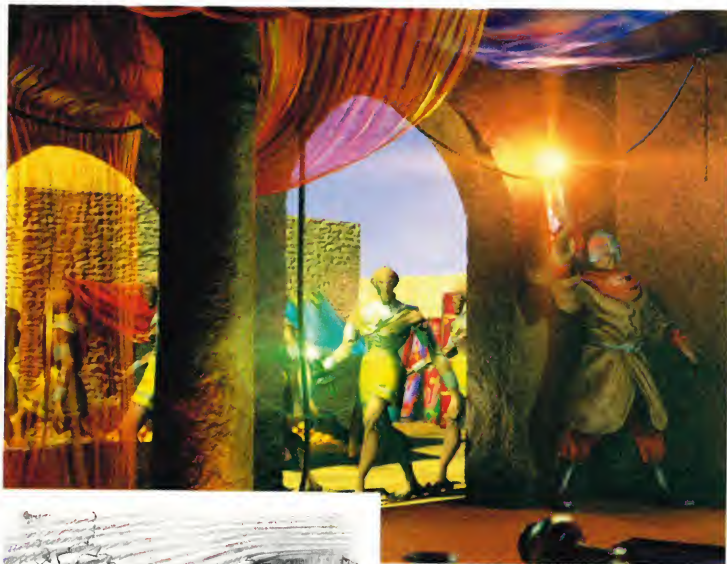
With no sign of your comrades and only your pistol for company, you'll have to find your way home with or without help from the local life forms. "We have simulated a whole ecosystem," says François Lourdin, Product Manager at Infogrames. "There will be six different environments, each with its own economy and inhabitants. One city level has 250 walking characters, each with the need to eat and sleep! You can just shoot at them if you want, but that might not help you



above: If you stand still and do nothing, the sun will set and the nocturnal animals will come out, such is the scope of Appeal's universe.

**"With our real-time shadow projections and rippling water effects, what we're offering is a complete interactive world which looks distinct from the rest."**

— François Lourdon, Infogrames



above: Infogrames is hoping that Cutter Slade will become as popular with the public as Lara Croft.

left: The voxel-based system can handle indoor arenas as well as broad open spaces. Don't expect to inflict much damage on the walls though.

## Artificially Intelligent – or are they?

To ensure that all the people and monsters in this artificial world act convincingly, the Appeal team has developed a system of character control known as GAIA (Game's Artificial

Intelligence with Agents). It's what programmer and Appeal co-founder Franck Sauer calls "a multi-agent based system." This means that the individuals encountered by

Cutter will not follow any set pattern – like the wolves in *Tomb Raider* – but will roam and make choices depending on what time of day it is or how you've treated them so far. "Events aren't scripted precisely, so they can be more freeform," explains Sauer. "We're trying to make it as real as possible. We have to account for all eventualities."

left: Appeal's founder members, Yann Robert, Yves Grolet and Franck Sauer



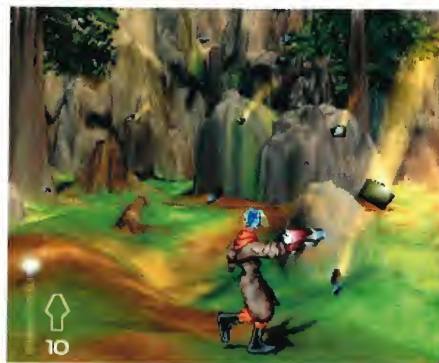
complete your quest. There will be many branching sub-goals, and you can go anywhere you like."

What will set *Outcast*'s apart from other walk-and-shoot adventures is that it will be voxel-based. Voxels are 'volume pixels', tiny scalable solids which are most commonly used to generate scenery for flight simulations, because detail is less important than a pleasant undulating effect. In a flight sim it's to be hoped you won't get too near to the ground, as voxels tend to be patchy when seen up close.

Appeal has overcome this problem with a bi-linear smoothing filter built into the software. Extra detail is added through coloured lighting and unique bump-mapped data. This means that the PC stores each image as a grey-scale map, with darker areas denoting deeper terrain. Translated to the screen and

given colour, the results range from rolling sand dunes to shop awnings and even on to the shadowed folds in a cloak. "In our eyes 3D-card games are starting to all look very similar," says Lourdin. "Voxels don't need accelerating so the result is a smooth moving, living planet even on low-end PCs. With our real-time shadow projections and rippling water effects, what we're offering is a complete interactive world which looks distinct from the rest."

Not completely interactive though, because one drawback of the *Outcast* voxel engine is that the landscape can't be dynamically altered – so there'll be no blowing your way through walls, cutting down trees or digging holes in mountains. Perhaps Appeal will remedy that in time for *Outcast 2*, already being discussed for sometime in 1999. **PCB**



left: Weather effects, such as an avalanche and even an earthquake, will disrupt Cutter's passage back home.

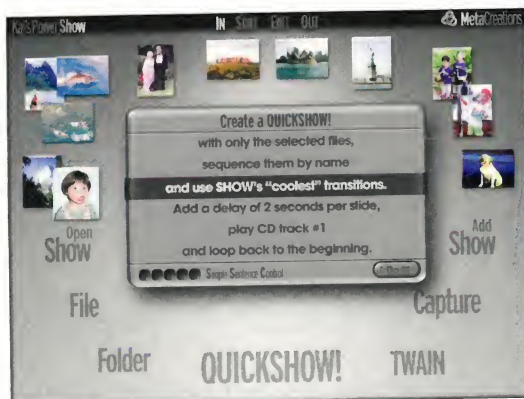
below: What a green and pleasant land Cutter's world is! Try not to spoil it with unnecessary violence.



right: A whole ecosystem has been created with living, free-roaming animals.







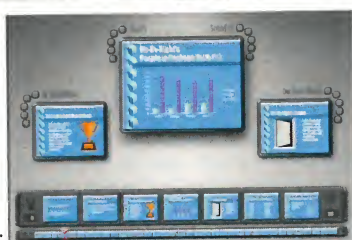
left: Make your slides dissolve with transitions.

below: Show off your holiday pics in an interactive display with Kai's Power SHOW



above: You can print out a presentation or place it on the Internet.

right: Slides, before and after.



# IT'S SHOW TIME

**Software:** MetaCreations brings all-singing, all-dancing presentations to your desktop. **BY GRAHAM SOUTHOORN**

Slide shows are a splendid excuse for inviting your friends round and impressing them with photos from your latest exotic foreign holiday. You just have to be careful that your commentary doesn't get too slurred as the booze flows throughout the evening.

Slide projectors have sadly declined from their height of popularity in the 1970s, but slide shows themselves could be poised for a comeback courtesy of Kai's *Power Show*, a \$49.95 presentation package from MetaCreations. And you don't have to gather people around a PC to see a presentation because there's an option to convert it into a Web page.

Until now, most presentation software has been aimed at business users – so while you can use a package like Microsoft *PowerPoint* to produce slide shows, it also contains chart and

graph-making tools that you'd never need. On the other hand, *Show* is mainly for fun, enabling you to enhance a static sequence of photos with animated transitions, captions and sound effects. You can even work on an existing *PowerPoint* presentation. "We're not trying to replace *PowerPoint*," explains MetaCreations' Joseph Linaschke. "The two work together, so that people can bring their existing slides into *Show*."

Even though *Show* is one of the rare applications that puts fun above pure functionality, it makes perfect sense for MetaCreations. Don't forget that this was the company responsible for the image editing software *Photo Soap* and *Power Goo*, both of which eschewed staid Windows toolbars and menus in favour of good-looking and intuitive tools like paintbrushes and pencils. With *Power Goo*, you could

with *SuperGoo*, with its digital version of the Mr Potato Head game. By making a selection from the hundreds of eyebrows, lips, ears and other facial features, you can come up with some truly goo-some composites. And by careful selection of parts you can make the face look more male, female, or a combination of both.

**The new Show puts fun above functionality... you can wacky animated transitions between photos, including nifty effects like rippling water and a swirling vortex.**


make the Mona Lisa smile if you liked.

*Show* works on the same principle as *Power Goo* and *Soap*, with rooms that you enter to perform different tasks. For example, in the first room you can take images from a digital camera or scanner, or import artwork or video clips from a disc. When you've assembled the raw materials, it's time to assemble them in the correct sequence in the editing room. Each image is stored as a thumbnail, which turns grey as you drag it into place. That way, you can see what pictures you've already added to your project.

Apart from shuffling the running order, you can add a variety of wacky animated transitions between photos, including nifty effects like rippling water and a swirling vortex. It's easy to keep track of the transitions you've added because the main slide you edit is flanked by smaller pictures of the previous and succeeding slides in the sequence. Changing the transition effect that leads into a slide automatically replaces the transition leading out of

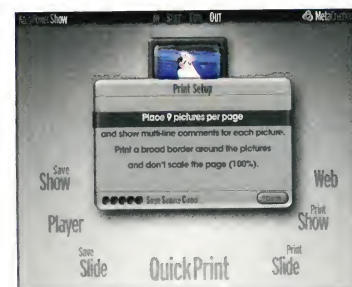
the previous one. All handy stuff.

As well as transitions, you can also easily add animated captions to each slide and enhance it with one of *Show*'s 200 sound effects, some of which wouldn't be out of place in a *Tom & Jerry* cartoon.

Having finished your presentation, you can either play it directly on your PC or export it to a Web page, although the basic HTML file that's created only stores text and pictures. Alternatively, you can share the full multimedia experience by saving it as a self-running file. This functions as a cut-down version of *Show*, and is small enough to put out on the Web for someone to download or distribute on a disk. Or for friends and family still stuck in the BC (before computers) age, you can stick it on a video tape or even print it out. After all, the show must go on. 

## It's all goo'd stuff

Designers at MetaCreations have certainly been busy of late. Not only does Kai's *Power Show* extend the company's range of digital photo apps – there's also a brand-new version of *Goo*. The original *Power Goo* enabled you to apply all sorts of twists, bends and tweaks to the human face. There's even more potential for silliness



above: Save shows on disc or the Net.



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## letter of the month: A friend writes

Dear PC Review,

First, as a long-time subscriber, I write as a friend. PC Review has always covered games, news, serious applications and so on. Furthermore, it does so in an adult way unlike some of your competitors whose scatalogical style seems to be written by illiterate teenagers for illiterate teenagers! I'm sure your approach is your best niche in a crowded marketplace where a more mature readership will develop.

There are a few areas that could be improved, of course. The journalistic standards are sloppy, from forgotten captions, sending us the wrong mag to basic grammatical errors like never knowing when to use 'affect' and 'effect' (wrong again in issue 82!). PC Zone readers wouldn't notice: your readers will!

You put a brave face on the lack of adverts, though I'm sure it is a worry to you financially. Taking your point about their intrusiveness, issues a couple of years ago were 50 per cent bigger for the same price. Not all of that was adverts. Admittedly you have an extra CD now, but *Xplora1*, optimised for 3.1 which made my system hang, is not exactly 'cutting edge'.

A real value of adverts were that after reading a review I could compare mail-order prices and order them. Unless PC review can cover the areas I'm interested in in sufficient depth, there is a danger of me and others deserting you altogether.

I hope these comments are helpful to you in planning the mag's future. Good luck in making it an adult, comprehensive, authoritative magazine – potentially the best in the market.

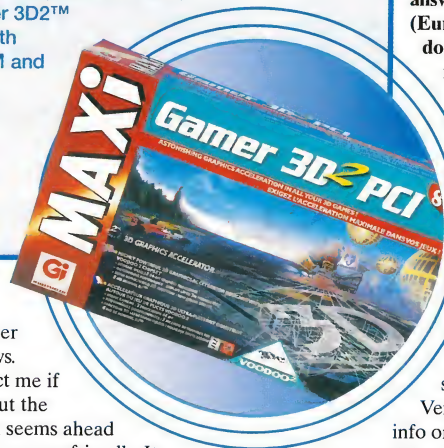
Kindest regards,  
Peter Bagshaw, Chew Magna

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Goodness. A catalogue of criticisms here, but we won't hide from them. I'm sure you've missed our occasional correct usages of 'affect' and 'effect' though, and we've got a new eagle-eyed sub in to make sure we have no more wayward captions. As for your coverdisc complaint – do you really expect full products that are brand new as well on the cover of a magazine? We do our utmost to bring you value CDs but there are limitations to what can be given away free. *Xplora's* a good disc even if it was a Windows 3.1 product. The relatively slight number of ads in the magazine doesn't seem to bother many readers and no, it isn't such a financial worry. Our aim is to get more people reading PC Review and at the moment we're devising one or two changes. To that end your comments have been quite helpful. Thanks!

Write in to win a Maxi Gamer 3D2™ card!

The lucky author of this month's best letter has won himself a mighty powerful new Maxi Gamer 3D2™ graphics card. Based on the well-respected Voodoo2™ chipset from 3Dfx, the Gamer 3D2™ comes with 8MB RAM and is worth £169.99. Contact Maxi on 0181 944 1940 for details.



Macs and even some obscure mainframes. While you may enjoy using the operating system that comes with your RISC-based computer, we don't actually consider RISC machines to be PCs, and we're sure they're not catered for with the range of software that Windows PCs enjoy. Like it or not, Windows is an established standard. You can see what's new in Windows 98 on page 24. Not surprisingly we've had a lot of letters attacking Microsoft this month while an almost equal number of readers seem to support the company. And yes, Tim is an *Aliens* fan.

**We want free games!**

Dear PC Review,

I enjoy reading your magazine and I recently put in an order at my newsagents to keep a copy back each month. The full programs you have been giving away are excellent and I hope you keep up the good work by getting more software like them. The thing I want to know is why you don't put full games on the front which may be dated but still playable, ie *Civilization* or *Sim City 2000*.

Keep up the good work,  
Craig Bell, via email

Hey, you wrote in last month, didn't you? The answer is that the games industry body ELSPA (European Leisure Software Publishers Association) doesn't allow companies to covermount games with magazines and we're abiding by its decision.

Games still make money on budget labels long after they're released and ELSPA wants to protect this revenue stream for its members. Remember, 90 per cent of games lose money, so a lot of publishers are after every little bit of cash they can get.

**You've converted me**

Dear PC Review,

I write after sampling my first copy of PC Review. Yes, I did buy it for the fantastic cover CD of 10,000 clip art images, but I found so much more within the pages of the magazine.

Very informative reviews and up-to-the-minute info on all that matters in the world of computing. What I would really like to commend you on is the breathtaking subscription offer. Not only do I save a whopping £10.88 on the cover price but I can choose a fantastic piece of free software valued at £39.99 which effectively gives me my first year's subscription for \$14.01. I want it and now!

Colin Young, via email

**Our subscription offer is on page 94 this month, if anyone else wants to join our merry club.**

**Reader Web sites**

www.thrust.co.uk/users/og/

– Dai Nelves

ourworld.compuserve.com/homepages/normanshaw

– Black King

**I'm a winner!**

Dear PC Review,

Thanks for the Hitachi DVD-ROM drive I won in the recent competition. It was really great news and just what I wanted. As soon as I get it installed and running I'll let you know how it performs.

Once again, many thanks

Phil West, via email

**RISCy business**

Dear PC Review,

First of all I'd like to say how great I think your magazine is. I first bought it in July and have bought it from the newsagents every month until I persuaded my Mum to subscribe in January.

I noticed in PC Review 80 that IBM's bid for the first 1000MHz chip will be based on a RISC architecture. I don't know if you have ever used one, but for six years our main PC in the house was a RISC computer. Unfortunately this system was becoming more squeezed by machines using Windows and Intel chips. I don't know whether you agree or not

but I find the RISC OS a lot better than Windows. Please correct me if I'm wrong, but the RISC system seems ahead and much more user friendly. It is true that both systems have their own advantages, but RISC does seem to come out on top. I find it such a shame that Microsoft strangles the market so much that other, maybe superior operating systems end up struggling to survive. Maybe Microsoft should buy out more of the other operating system's ideas, since they have now completely cornered the market. Then at least we could have the best of both worlds.

By the way, is Tim Cant a fan of the *Aliens* films? He often quotes from them in his articles.

Andrew Tidmarsh (15), Cumbria

**Some interesting points there, Andrew. RISC is a chip architecture that uses a reduced instruction set. Such processors have been used in Acorn computers, Apple**

## COMPETITION WINNERS

The seven lucky winners of Pace 56 Solo self-memory modems offered in the May issue are: Jean Grzesik (Sheffield), Anthony Jacks (Cheshire), Irene Jara (London), J Kemp (Chippenham), James Sherwood (West Sussex), Mark Stewart (Surrey), Steve Tibbitts (Coventry)

## CONTACTING PC REVIEW

The Mail, 30 Monmouth Street, Bath, BA1 2BW.

e-mail: pcreview@futurenet.co.uk

Note: We reserve the right to edit your letters for the purposes of space and clarity.



Prizes worth over £1600!

The Internet sees with many eyes, and you can look through them. That's not to say it's some kind of Biblical monster. What's happening is that people all over the world are connecting Webcams to their PCs and using them for video conferencing. Some people leave their Webcams on 24-hours a day, piping video to Web sites where you can see what's going on. With Webcams trained on a fish tank in L.A., Jenni's bedroom in Boston, and a view of Sydney harbour, the Net is becoming a digital panopticon.

Now you too can get into Web broadcasting thanks to VideoLogic and PC Review. We've got ten Captivator PCI/VC kits to give away, each of which features not only an attractive, high quality Philips Webcam but also a VideoLogic Captivator video capture card.

Fitting into a PCI slot on your motherboard, when combined with the camera the Captivator can produce video at 30 frames per second and resolutions of up to 320x240, or 750x540 for still shots. The package includes five separate video conferencing packages including the full version of VDO Phone Professional, plus trial versions of four others including CU-See Me and Netmeeting. VDO Phone Pro is good as it supports both Net and direct dial, modem to modem videoconferencing. As there is Video for Windows capture support, Captivator is compatible with all Win 95 videoconferencing and video capture applications.

The Captivator PCI/VC kit sells for over £160, and will prove a great addition to your PC setup. We reviewed it in our last issue where we awarded it a nine out of ten. So enter today and join the Webcam revolution!

## WIN A WEBCAM AND CAPTURE CARD

Yes! A VideoLogic Captivator PCI/VC kit could be yours. Enter today.

### How to enter

If you'd like to try and win one of these wonderful Webcam kits, you must first correctly answer these very difficult questions:

1. Which company produces the Captivator PCI/VC?
2. What mark did PC Review award the Captivator bundle in a recent issue?
3. What is the Captivator's maximum video resolution?

Write your answers down on a postcard or on the back of a stuck-down envelope, along with your name and address. Read the rules below, then send your entry to Captivator Competition, PC Review, 29 Monmouth Street, Bath BA1 2DL. Alternatively, email your entry to [graham.southorn@futurenet.co.uk](mailto:graham.southorn@futurenet.co.uk). VideoLogic has requested that entrants include their phone numbers with entries to make delivery of the prize that little bit easier. But don't worry, we have better things to do than ring you up to bother you!

### The Rules

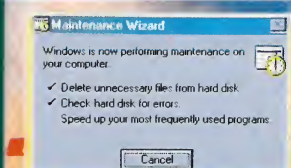
1. All entries must be received by 10 July, 1998.
2. This competition is closed to employees of Future Publishing and VideoLogic.
3. Only one entry per reader.
4. Please indicate on your entry if you do not wish to hear of other offers or products by VideoLogic.
5. The names of winners will be published in the September issue of PC Review, on sale 6 August, 1998.
6. No purchase necessary.

right: The Captivator PCI/VC includes a Philips Webcam and a VideoLogic Captivator board for around £160. For more information call Videologic on 01923 260511.

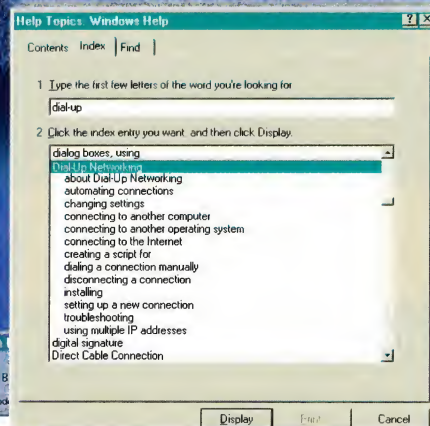




# WINDOWS



**NEW  
VERSION!**





# 98

# SHOULD YOU UPGRADE?

Windows 98 may be rocking the judicial establishment in the States, but on June 25 you should be able to buy it. The question is: **do you really need it?** Find out with PC Review. **BY GRAHAM SOUTHOON & GARRICK WEBSTER**

**M**icrosoft Windows is by far the most widely-used operating system for desktop PCs. So when the software company owned by Bill Gates releases a new version of Windows, everyone in the PC world has to sit up and pay attention. Undoubtedly the most important software release of the year, Windows 98 immediately poses a question to all current Windows users: do I need to upgrade? Throughout this 11-page feature, that's what we'll be investigating.

Windows 98 arrives with a lot of baggage. We weren't even sure we'd be writing about it this month as right up to our deadline the launch of the new operating system looked in jeopardy. As we go to print, 20 American States have filed anti-trust suits against Microsoft, with the Federal Government in the US looking at ways of tackling the company for its alleged anti-competitive tactics. So, if it's June 25, you're reading this feature, and Windows 98 isn't on the shelf, you can blame it on the Feds.

Like us, Bill Gates believes Windows 98 is massively important to the PC industry. Bill's stated that to delay the release of this version of Windows will damage the entire PC market. Here at PC Review we'll certainly be damaged if the release is delayed, as we're going to look silly with an 11-page feature on a product no-one can buy. But we still tend to think Bill is exaggerating a bit.

Consider this. When Windows 95 was launched, Microsoft spent a reputed \$200 million promoting the product. Remember *Start Me Up* by the Rolling Stones blaring from those TV ads? And that free copy of the *Times* laid on by Bill? Ahh, the crazy days of August 1995. Yet this time around Microsoft is spending in the region of just \$10 million and company officials have said they're not expecting big revenues from the product. Contrary to what Bill Gates has said, Windows 98 doesn't seem that important to Microsoft's budgets. So why is he telling everyone that delaying the release will damage the computing industry in general? Meanwhile we end up asking ourselves: if Microsoft isn't fully behind Windows 98, do we really need to upgrade right away?

Windows 98 looks and feels a lot like Windows 95 did. On the other hand, Microsoft claims to have made 3500 refinements, addressing 60 support issues. The company says that Windows 98 will satisfy 76 per cent of the feature requests users have made. In this article, we'll be looking for this new functionality across four main areas.

First we'll look at the most important thing: how Windows 98 will affect the day-to-day performance of your PC. Then we'll look at Windows 98 and its built-in Web browser, plus a range of other Internet-related issues. We'll also consider the new hardware support Windows 98 offers, including issues surrounding the Universal Serial Bus (USB). Our evaluation will conclude with a look at Windows 98 and PC entertainment.

Once we've had our say, we'll address a few other questions when we interview Microsoft's Windows 98 product manager for the UK, David Weeks. Finally, we'll round everything off with our final verdict on Windows 98. As we've said, Windows 98 is the big software release of the year, so read on to see if you need to upgrade.

**Microsoft claims to have made 3500 refinements, addressing 60 support issues. The company also says that Windows 98 will satisfy 76 per cent of the feature requests users have made.**

## In this feature you'll find...

<b>Windows 98 and your PC</b>	page 26
What Windows 98 means to PC performance	
<b>Windows 98 and the Net</b>	page 28
Internet Explorer's integration and more	
<b>Windows 98 and your hardware</b>	page 29
USB, Firewire and better power source control	
<b>Windows 98 and PC Entertainment</b>	page 31
Will Windows 98 give you more fun than 95?	
<b>Microsoft Word</b>	page 32
We interview MS bigwig David Weeks	
<b>Should you upgrade: the final verdict</b>	page 34
Summing up the pros and cons of Windows 98	

Microsoft  
Windows 98





# WIN98: WHAT'S

Let's go to work with the **key new features of Windows 98** exposed, examined and evaluated.

**W**indows 98 might be the PC world's most significant piece of news this year, but we have to admit, it doesn't look that different from Windows 95. There are, however, a broad range of features in this new operating system that have the potential to change the way we use our PCs. Over the next six pages, we'll go over all the main tweaks, improvements and changes Windows 98 brings. Along the way we'll cover the performance of your PC, tuning in to the Internet, extended hardware support and, perhaps most importantly, what Windows 98 means for PC-based entertainment.

## Win98 and your PC

Windows 98 is here. Yeah, great. But what users up and down the land want to know is whether or not making the upgrade will improve the performance of their machines. Microsoft, boldly, is claiming that Windows 98 is 30 per cent faster at booting up applications compared to Windows 95. When you think of those frustrating waits while your PC loads up *Word*, this sounds like a clear benefit. Let's take a look at how the extra speed advantage is achieved, plus some of the other PC performance issues Windows 98 raises.

### More efficient memory

Though Windows 98 looks very similar to Windows 95, under the hood things are very different. A lot of the core code – the kernel in programming parlance – has been rewritten. Though Windows 98 has more in it than 95, it sits in a more compact way. Comparing the system resources of two P200 machines with 32MB of RAM each, we found the Windows 98 system



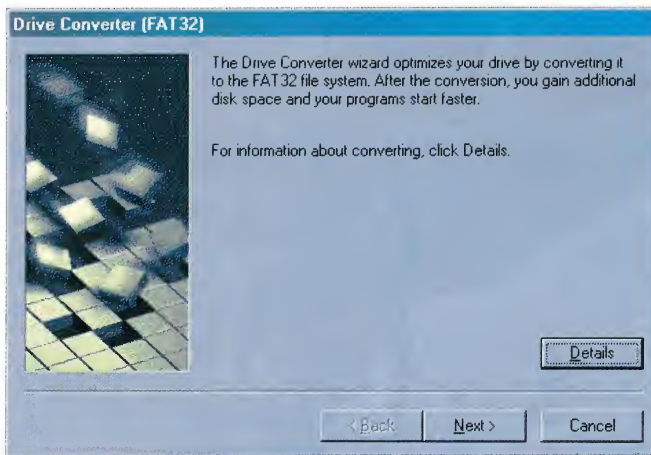
above: In Windows 95 this PC reports 88 per cent of system resources available. Under 98 it would report 96 per cent. Now that's progress for you!

## The minimum system

To run Windows 98 you'll need at least the following:

- 486DX66 or better ■ 16MB RAM (32MB is strongly recommended)
- CD-ROM or DVD-ROM drive ■ VGA monitor or better
- 120MB hard disk space free, minimum (a typical installation is 195MB, the largest is 295MB) ■ Mouse

right: *The innocuous looking Drive Converter could free-up 30 per cent of your hard disk space by reordering your data.*



## The right price

The official price of Windows 98 will be £85.50. However Microsoft expects to see the program on sale for around £80 in the shops. Mail order houses will probably stock it for between £60 and £70, so shop around.

reporting 96 per cent of system resources free. The Windows 95 machine reported only 88 per cent free.

Windows 98 is also better at storing things in RAM and retrieving them. A large number of crashes under Windows 95 came about because the system was poor at checking memory addresses. Conflicts would occur, applications would look for data and not be able to find it, and we'd end up with system memory errors quoting incomprehensible memory addresses or, worse still, The Blue Screen of Death. At that stage there's no option but to restart.

One system manufacturer we spoke to reported that its users found Windows 95 crashes once a day on average. We've used Windows 98 for two weeks and only had one serious crash. We haven't yet had the Blue Screen of Death yet. For all we know it could be the Yellow Screen of Death with Windows 98... All this was on a machine that used to crash twice a day.

### FAT32 leaner and meaner

Although Windows 95 was the first 32-bit operating system for the PC, various parts of its code remained in the old 16-bit format used by Windows 3.1. One hangover from the old days was the system used to map out your hard disk – the file allocation table. This may sound like so much jargon, but the file allocation table (FAT) is actually very important. It's what the operating system uses to organise where information is stored on your hard disk.

Windows 95 uses a 16-bit file allocation table called FAT16. Windows 98, however, has moved to a

system called FAT32. Being a 32-bit solution, FAT32 is inherently more efficient at sorting out your drive space. The storage area of any hard disk is broken up into segments called clusters by the file allocation table. A single cluster can store one file, or part of a larger file, but cannot store two or more small files. Under FAT16, the cluster size varied from 4K to 32K, in proportion to the size of your disk. If you have a big hard disk with 32K clusters you'll find yourself wasting a lot of storage space as 1K files can occupy entire 32K clusters.

With FAT32 in Windows 98, however, the cluster size is a standard 4K. This means aggregates of files 1K to 3K in size waste far less disk space on today's larger hard disks. Microsoft claims that by moving to FAT32, users will free up 28 per cent extra disk space on average. We found a 30 per cent increase, but then we're not average.

### No more partitions

But wait. FAT32 does more. Anyone who's bought a PC recently will probably have a hard drive of 3GB or larger. As under FAT16 the largest disk size supported was 2GB, users with larger drives will find their hard disks are partitioned into smaller sections, each with their own drive letters. One hard disk can encapsulate C:, D:, E: and F: drives.

That's crazy. With FAT32 and Windows 98, single discs can stretch in size into the terabytes (millions of MB). That means less searching and sifting, and hard disk management should be easier in general. In this respect Windows 98 clearly improves on Windows 95.

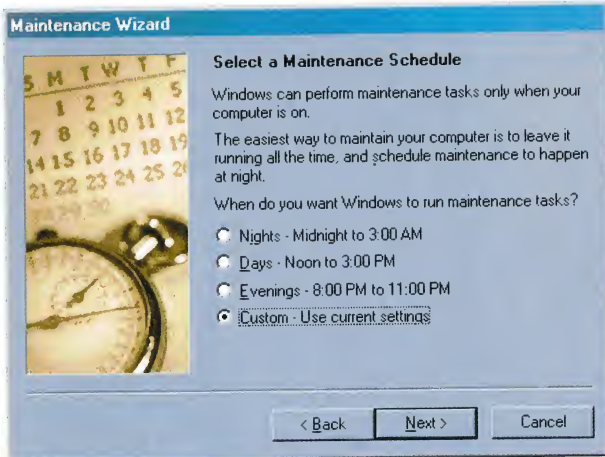
There are a couple of provisos we should mention at this stage. Later service releases of Windows 95 did come with the capacity to upgrade to FAT32 and many power users have actually done this. For them, the upgrade to Windows 98 won't mean quite as much. Secondly, FAT32 disagrees with some 16-bit software such as old DOS and Windows 3.1 programs. It's entirely conceivable that moving to FAT32 will actually mean you won't be able to run some of your older applications.

### There's no going back

In their infinite wisdom, the developers at Microsoft have already thought of this. When upgrading to Windows 98 an option box does come up asking if you would prefer to keep your old FAT16 system. If you do elect to stay with FAT16 Windows 98 will run slower than it would with FAT32, and you won't have as much disk space spare either.



# IN IT FOR YOU?



left: *The Maintenance Wizard can schedule hard disk checks and clean-up operations and perform them regularly for you.*



On the other hand, if you do move to FAT32 and decide you don't like it, there's no going back. Though Windows 98 has a facility enabling you to go back to Windows 95 with ease, if you've moved to from FAT16 to FAT32 your disk will have been totally reordered and you'll have to reinstall Windows 95 from scratch to get back to the way things were. Clearly, a big part of your decision to upgrade will rest on how much older software you use and whether or not it will run with Windows 98 and FAT32.

## Faster, faster, faster

Not only does the 32-bit file allocation table free up disk space and make your hard drive easier to manage, it's also responsible for a large part of the speed boost Windows 98 will give your machine. Smaller clusters are read faster – it's as simple as that. Furthermore, Microsoft has built into the new

operating system a neat little wizard that helps you to regularly enhance your PC's performance.

The Maintenance Wizard in Windows 98 enables you to schedule various hard disk checks. Firstly, it can comb your disk for errors, pre-empting difficulties before they happen. Secondly, the Maintenance Wizard is able to identify and delete unnecessary files and fragments of unused data from your hard disk. Lastly, and most importantly from a performance point of view, the Wizard will reorganise your drive in such a way that your most commonly used programs are sorted to the front of the disk's read sectors. This means your PC will be able to find and boot your favourite apps much quicker. Let's see, for us that will mean *Quake2* and *StarCraft* will be our fastest loading programs... Now that is welcome news.

The long and sort of it is that you can kiss goodbye to those tedious old defrag sessions that were a necessary evil of Windows 95, and set Windows 98 to regularly and automatically clean, tidy and optimise your hard disk. Three cheers to that!

## Fewer crashes too?

A hard disk that's regularly buffed and polished (don't take that literally, folks) will fail less often, and this should mean there's less chance of confused drive heads damaging essential files. At best a corrupt or missing Windows file will prevent the functioning of a non-essential utility, but at worst it can bring your system to its knees. To address this issue, Microsoft includes a System File Checker in Windows 98.

The most common problem is a Dynamic Link Library (DLL) file that's been corrupted or erased by a rogue application during installation. If you get error messages about a missing DLLs you can run the System File Checker, which looks for damaged and missing Windows files. If an application fails to run owing to a missing DLL file, for example, the System

File Checker immediately identifies the troublesome files and either automatically restores them or prompts you to insert the correct installation disc. To be on the safe side, you can also back up the existing files before it takes any action.

## Troubleshooting with Dr Watson

Windows 98 takes another small but significant step towards becoming a self-maintaining system with the inclusion of the diagnostic tool Dr Watson. Previously found in Microsoft's networking OS for businesses, NT, Dr Watson takes a snapshot of your system when something goes wrong, sniffing out the software that's failed. It then investigates the cause of the problem and suggests a course of action. Dr Watson is actually used by Microsoft telephone support operators, so it makes sense to bundle it in Windows 98.

Upgrading software has often caused problems under Windows 95, with new programs installed over older versions of the same software. Trouble arrives when the new software conflicts with other applications or hardware in your system. Windows 98 gets around this problem with a simple back-up utility called the Version Conflict Manager. This automatically makes a backup of the old application on your hard disk so that you can easily restore it if there's a problem with the new software. And when you do restore a backup, the new version is saved too so you can restore either. It's a neat idea but conflicts between software occur so rarely it's hard to get excited about this particular utility.

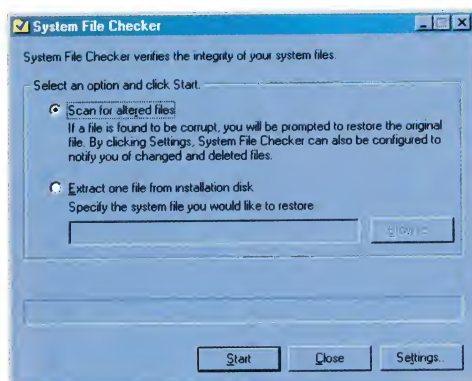
## Better get Help!

No matter what improvements an operating system contains, it should always provide users with help. It has to show people how to do the things they want to quickly and as simply as possible. Windows 95's Help system was good but it's been radically overhauled, making it more comprehensive and easier to navigate.

The Contents, Index and Find tabs have been retained but the Help files themselves are contained in a single box rather than a separate Window. It's a bit like browsing a frames-based Web site, and you can easily flick between files you've viewed using the forward and back buttons on the menu, which work like a Web browser. The interactive Help section has also been expanded, with each troubleshooter offering more suggestions to try.

If you're still stuck, clicking Web Help takes you to the Microsoft Support site where there's a bigger database of help files and troubleshooting documents that you can search by typing in a keyword or a query in plain English. The results are listed with the most relevant documents first, just like a conventional Internet search engine. In addition there's an archive of Frequently Asked Questions on the site together with tips for Microsoft apps like *Outlook 98*, *Internet Explorer*, and *FrontPage 98*.

*continued over*



above: *Regularly searching out duff system files, then replacing them with good ones, will go a long way towards helping to prevent crashes and locks.*

## What's an operating system?

Those new to PCs may not be familiar with the term 'operating system'. Often referred to as an OS for short, an operating system is the most crucial piece of software in your PC. Your operating system controls all the hardware in your machine. For instance, an operating system controls the way files are

stored on your hard disk. If you're using a word processor and you wish to print a letter, your software sends the message through your operating system, which directs it out through your printer port and to the device.

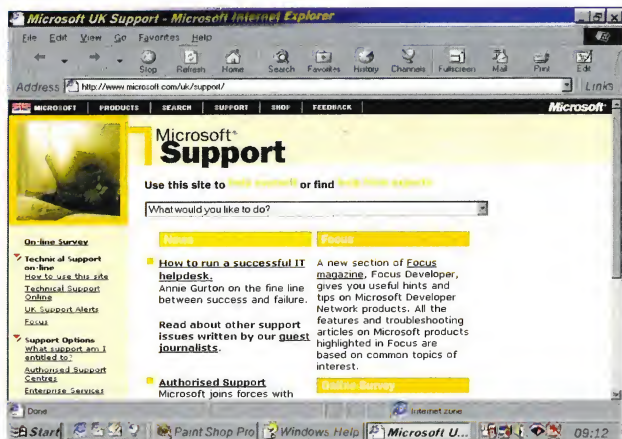
An operating system also controls the way software runs on

your PC. It's like a layer, sitting there in your PC's memory. On top of it sits the software you wish to run, and below it is the hardware which makes the running of the software possible. There are plenty of different sorts of operating system.

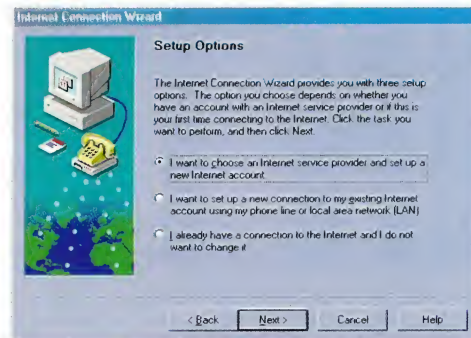
Some, such as UNIX, are simple and textual. Users have to know all

sorts of commands to get their systems doing what is required. Other operating systems, like Windows, present a helpful graphical interface wherein users navigate through different levels of the interface to find the features and functions they need. Well that's the theory anyway.





left: The Microsoft Support site complements the help system built into Windows 98, but you need to be online to use it.



right: This handy wizard connects you to the Net quickly and easily, and will even find you a service provider if you haven't already got one.

Online help is certainly a step forward but it's surprising that integration with the Web doesn't go further. There aren't any direct links from the Windows' Help menu to topics online, and there appears to be no way of adding a Help topic to your local Help database to save you going on the Net.

## Windows 98 and the Net

Speaking of the Internet, one of the Windows 98's key points is the fact that it's got Microsoft's *Internet Explorer* software built in. Much has been made of this, with some claiming that it's unfair for Microsoft to continually add formerly stand-alone applications to Windows, thus putting companies that make such apps out of business in the process. On the other hand, fusing a Web browser with the actual operating system makes the Internet seem as though it's just an extension of your desktop. The concept is quite inspiring, so let's get a broader overview of how Windows 98 reaches out to the Internet...

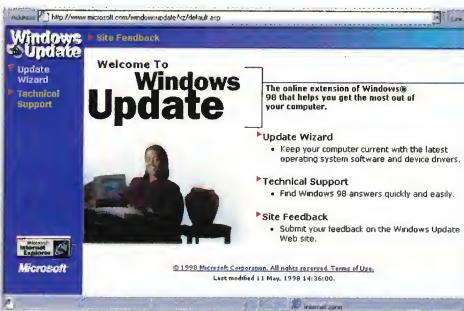
### Windows updates

Windows 95 has been updated several times over the last three years. The version shipped with new PCs in 1998 is much improved over the first release. In contrast, improvements to Windows 98 won't be shipped in mass service releases on CD-ROM, but will arrive piecemeal over the Internet. You'll be able to keep your version of Windows on the cutting edge by downloading the new components from a purpose-built Windows Web site. Once you've logged onto the site, you can access the Update Wizard, which scans your the length and breadth of your hard disk to see if anything in your Windows system is out of date. In this way you can also update device drivers for new hardware, and install Windows service packs containing the new utilities.

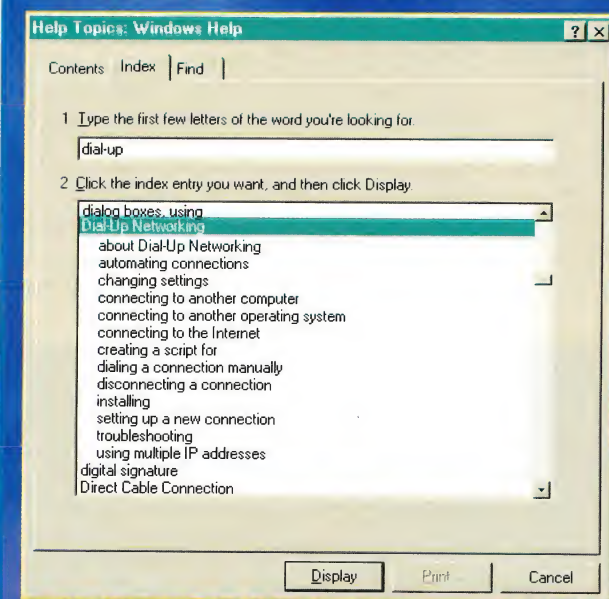
This is a big step away from the confines of the CD-ROM distribution model, and takes us in the direction of operating systems that configure and maintain themselves using the Internet. Microsoft insists that no updated versions of Windows 98 will be released on disc, which must mean that new hardware drivers will be posted on the Web. So far, however, we've only found drivers for Microsoft hardware at the Update site. Hopefully drivers from all the other manufacturers will appear there forthwith.

A big drawback of the online update system is that to enjoy the full potential of Windows 98 you have to be on the Internet. It may sound obvious but if you're not online, then your version of Windows 98 will eventually date, and one day in the not so distant future hardware and software will come along that won't work with your system. Inevitably, the drivers and updates will have to be carried on discs either included with the product, or mailed out by its manufacturer or Microsoft itself. Either way, the churn and change that constantly goes on in the PC world

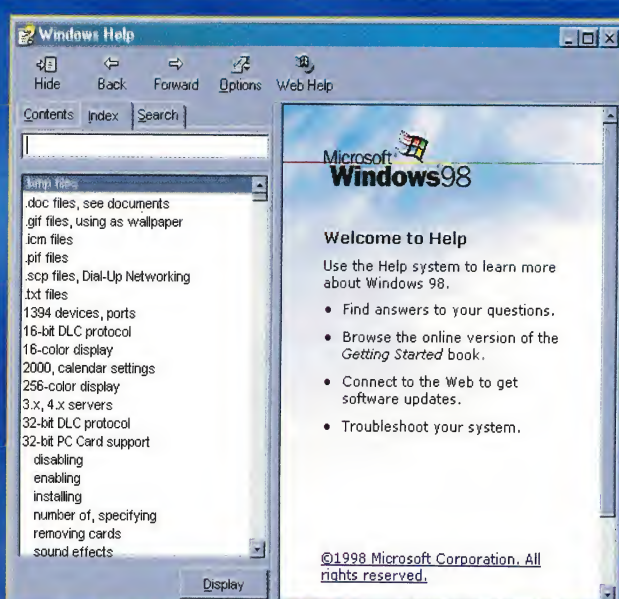
below: *The Update Wizard and Windows Update site team up to keep your Windows 98 system in top nick at all times - if you're an online user, that is.*



## Win95 v Win98: The Help System



left: The classic Windows 95 Help system is a bit stiff compared to Windows 98. To be honest, we rarely used it.



right: With Windows 98 searching, browsing and reading help entries can be done through a single Window.

will mean Microsoft's dream of one OS, one CD will probably not materialise.

## The Active Desktop

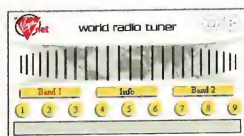
At first glance, you'd be forgiven for wondering how Windows has changed. Apart from new buttons on the taskbar, the Windows 98 interface looks the same as Windows 95, complete with a Start menu and desktop icons. If you like the modus operandi of your Web browser, however, Windows 98 gives you the option of discarding the classic desktop in favour of a Web-style interface called Active Desktop.

The Active Desktop isn't new. You may already have installed it with the *Internet Explorer 4* Web browser, although many people didn't bother because it eats slow PCs for breakfast and can cause major difficulties on a large proportion of machines. That said, running the Active Desktop is much more attractive with Windows 98 because it's fully integrated into the operating system. That makes it stable, for one thing, and capable of running smoothly on slower Pentium machines.

The main feature of the Active Desktop is that it turns your wallpaper (the desktop's background pattern) into a Web page, which directly downloads information from the Net into banners, buttons and boxes on your desktop. Clicking on these items brings up a Web page inside *Internet Explorer*. Supplied with Windows 98 is a Channel Bar that enables you to subscribe free of charge to Web sites by top online services such as MSN, BBC, Financial Times, Vogue and Virgin Net. The Channels alert you when their sites have been updated, or you can even receive updates pushed to your desktop automatically at regular intervals.

While only the Channel Bar is bundled with Windows 98, there are many other useful desktop items to download from Microsoft's massive site. For example, there's a scrolling stock market ticker that updates itself with the latest share prices, a jukebox that constantly plays music from the Net, and a travel application for displaying scenic photographs.





Virgin Net's radio tuner allows you to listen in directly to radio stations from all over the world. Either click one of the buttons numbered one to nine, or scan across the dial above and pick one of your choice. The two selector buttons show alphabetically listed stations.

Why not set the Virginette as a Desktop Option by clicking on the button. That way, you can listen to the radio whenever you fancy without having to open a browser.

You will need RealAudio software to listen in. We recommend you can download the latest RealPlayer by clicking [here](#). Make sure you come back once you've installed the software.

A word on reliability: Internet broadcasting is a new medium, and some stations experience technical difficulties. If a link is down and you see an "error" message it may be a temporary fault. Please try again later or report the fault to us at Virgin Net.

above: **Wireless?** Virgin Net's active channel can pipe radio signals to your PC down the wire, leaving the airwaves free for better things.

The Active Desktop also changes how you use the interface. Icons function exactly like Web links (they're even underlined), so you only need to click once to launch an application and/or open a file. In practice we found this somewhat frustrating because it's easy to click by accident and launch an application unintentionally. If you're used to the Windows Explorer you'll end up opening files and applications when you only meant to select them. Drag selecting files is even stranger. Instead of holding down the left mouse button and dragging over the files you want to select, with the new system you hold [Shift] down, but no mouse button. This feels odd compared to what we're used to.

## Underlining the link

Most significantly of all, Windows Explorer and My Computer windows function just like Internet Explorer, with forward and back buttons for easy navigation and a Favorites menu for bookmarking both local documents on your hard disk online and Web pages. What's more, Web pages appear on the folder tree in Explorer, with an icon for the page on the left. This makes it easier to navigate between Web pages and documents on the hard disk and displays related pages in the same site.

There are two other little tweaks we particularly like about the new interface. The first is the taskbar button that minimises all open applications simultaneously so that you can see the entire desktop. The second is the fact that you can change the order of icons in the Programs menu by clicking and dragging them into place.

Of course, if you're used to the Windows 95 way of working, you can easily change to the traditional system using the Active Desktop menu which is found in Settings from the start menu. Here you can opt for the retrogressive option to switch off the Active Desktop entirely. You'll just see plain old wallpaper instead of the channel bar. You can also turn off the single-click icons from the Folder Options Menu, which is also found in Settings.

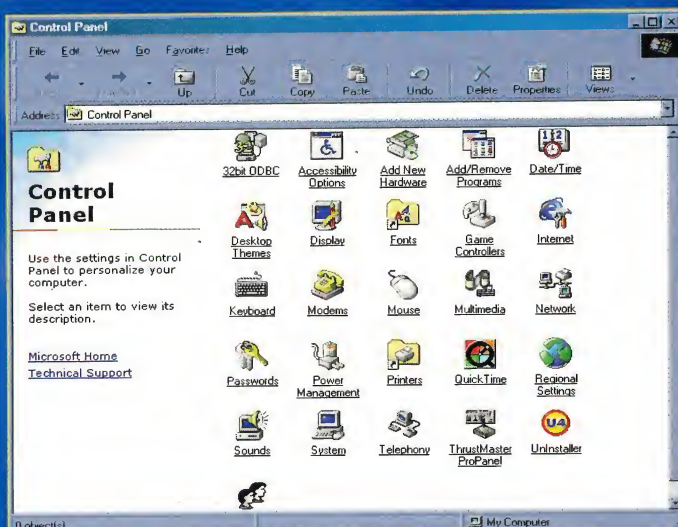
## Internet Connection Wizard

Getting on the Internet in the first place can still be a bit of a chore at the best of times. First of all, you need to configure your Internet software with the correct telephone number for dial-up access to your Internet Service Provider (ISP) and input the names of its mail and news servers. Windows 98 claims to take this strain away with its Internet Connection Wizard. The Wizard dials up Microsoft's Internet Referral Server, which provides a list of ISPs in your area, complete with information about the services offered by each one. Selecting an ISP takes you automatically to its Web site, then prompts you for your credit card details, and instantly configures your software.

It sounds on paper like a real boon, but when we actually tested Windows 98 only six ISPs were listed for our region. All were major operators, including UUNET, BT Internet, Demon and Easynet. There were some notable absentees, including Virgin Net and all the many small ISPs operating across the UK. Unless the service becomes more comprehensive, it seems that sadly the Internet Connection Wizard will be no more than a shop window for the industry giants. So nothing new there then.

## One system, a choice of three (inter) faces

right: *Here's the Windows 98 desktop in all its Web browser-style glory with our active channels on the right.*



left: *With or without active channels, you can set your Windows and icons up to work like Web pages with browser buttons and single-clicks to open files.*

right: *Alternatively, it's even possible to have Windows 98 working just as 95 did, with no fancy buttons and double clicks required to open documents.*



## Win98 and your hardware

We can't imagine there are many lucky people out there who have installed hardware with no problems whatsoever. Windows 98, however, claims to make hardware installation a veritable plug-in-and go affair. We've been there before, though, haven't we. Remember Plug n Play in Windows 95? We do. We also remember installing, reinstalling and configuring drivers for about 50 per cent of the hardware upgrades we ever made under 95. Fingers crossed this time and let's see how Windows 98 is different.

## The Universal Serial Bus

If you've bought a PentiumII-based PC, chances are it will have a Universal Serial Bus (USB) round the back. Nestling in amongst your serial, parallel, game, mouse, video ports and the rest, the USB provides a new way of connecting small peripherals to your PC. You simply slot your USB sheetfeed scanner, modem or joystick into the back and it should (in theory) work straight away with Windows 98. You don't even need to restart your machine.

The new operating system makes this possible by recognising the new device and configuring *continued over*





Hardware, like this sheetfed scanner, will plug into your PC via the USB port, drawing power from your machine while pumping data back at 1.5MB per second.

the correct software. While Windows 95 enables you to use USB peripherals, only Windows 98 has a database of software drivers for the 150 devices already available.

Pentium II PCs possess just one or two USB ports, but you can theoretically add up to 127 peripherals to the same PC by daisy-chaining them together. For this you'll need one or more USB hubs, which contain several ports and act like trailing extension sockets. You can also share peripherals between PCs this way. Of course, nobody wants a tangle of extra wiring, which is why USB handily does away with separate power supplies. Instead, peripherals are fed power through the PC and USB cable, provided they don't require more than a 5V supply.

There are two other big advantages with USB. The cables carry data in both directions, which should make force feedback joysticks and mice more responsive and probably more commonplace. And because they transfer more data more quickly than existing methods of connection – up to 1.5MB per second – new types of hardware are suddenly possible. As well as USB modems, mice, keyboards and joysticks we'll see speaker systems that don't need soundcards to process the data first, fingerprint scanners, PC telephones and other devices that are still being dreamed up.

With USB we're expecting an explosion of about 100 new small peripherals for the PC – many with strange and wonderful functions – in the next year.

Another 250 are currently in development. Proper plug and play is long overdue but no less welcome for that. Get ready for the revolution.

### The Firewire connection

While USB makes our lives considerably easier, it's not suitable for every piece of hardware you might want to control or use with your PC. The maximum amount of data it can shift is 1.5MB per second, so it can't handle video in a high quality format such as MPEG2 or even large still pictures. That renders USB unsuitable for plugging in DVD players, digital video cameras, flatbed scanners and the like.

To get around this drawback, the computer industry has come up with a new type of connection standard called IEEE 1394, which you may know by the name FireWire. This transfers data at phenomenal rates of up to 50MB per second, and an even better standard for 125MB per second is in the pipeline.

You will be able to add FireWire peripherals with Windows 98, but it's not something you're going to need in a hurry. Home PCs aren't being sold with IEEE 1394 ports, and the peripherals themselves are very thin on the ground. It's certainly going to be big in the future, but we expect that future to be at least two years down the line.

### Power down

Something that's never really been addressed by a Windows operating system, until now, is the PC power

supply. There are reasons for leaving your machine switched on continuously but doing so wastes energy.

This summer sees the launch of PCs capable of going into standby mode just like a TV. The PC receives a trickle of electricity, but the hard disk and monitor aren't powered up. Such PCs can wake up fully in less than 10 seconds to answer an incoming calls or to perform scheduled tasks.

Windows 98's OnNow function enables you to set the time interval before your monitor and hard disk switch off, much like a screensaver. In order to use it though, you'll need a PC with ACPI (Advanced Configuration and Power Interface). These will go on sale this summer. OnNow should enable us to leave our PCs on 24-hours a day if we like, without consuming much power at all. You could set your PC to wake-up from its standby mode and download something in the middle of the night, or perform Maintenance Wizard functions when you're not around. This may prove useful if you run a small office based around your PC as it means your PC (via the modem) will be able to receive faxes and take phone messages while you're away.

On the other hand, self memory modems are available, and Energy Star compliant monitors already shut themselves down if you set them to through Display Properties window in 95. Finally, if you buy an ACPI PC it will almost certainly have Windows 98 installed anyway, so the energy management feature won't affect your decision to upgrade.

## Windows 98 Plus! – the first Win98-only utility

June 25 will go down in history not only as the launch date of Windows 98, but it will also see the introduction of the first Windows 98-specific product, *Windows 98 Plus!* The *Plus!* pack proved very popular for Windows 95, and *Plus!* for 98 contains a similar mixture of fun and useful bits and bobs. Selling at £39.99, here's what it contains:

**McAfee Virus** – to keep your PC virus-free, this digital disinfectant integrates itself with the Maintenance Wizard and includes six-months worth of free virus hunting updates.

**File Cleaner** – a handy utility from CyberMedia that helps optimise your hard drive by tidying up dead links that result when software is deleted or uninstalled.

**Compressed Folders** – this archive tool will compress files using a simple drag-and-drop interface. Just drag in the files you want squished, and you'll save on hard disk space.

**Desktop Themes** – some people like to customise their desktops with fun themes using original wallpaper, cursor shapes, icons and sounds. Included here are themes based on *Doonesbury*, *Garfield*, *Peanuts*, *Corbis* photographs, *Architecture*, *Geometry*, *Fashion*, and even the *Horror Channel*.

**Deluxe CD Player** – this console not only plays CDs, but automatically links the disc with Internet information on the bands and songs via Web sites including *Billboard Online*, *Music Blvd.com* and *Tunes.com*.

**PictureIt Express** – a cutdown version of Microsoft's image editing software, *PictureIt*. Soften edges, change contrast and remove red-eye from your photos.

**Games** – Ah, remember *Solitaire*? Well *Plus!* has the upgrade, *Spider Solitaire*. It also includes the *Tetris*-esque puzzler *Lose Your Marbles*, and *Microsoft Golf 98*. So know your know!



left: Check the back of your PC for one of these USB ports. If you haven't got one Windows 98 may not be much use to you and your hardware collection.



## Win98 and having fun

Microsoft has fought tooth and nail to bring Windows-based entertainment into the mainstream of leisure activities. Indeed, the company has even set up a games division enjoying great success with *Age of Empires* and *Outwars*, in addition to its traditional biggy, *Flight Simulator*. With Windows 98 there's a clear intention to make your PC a one-stop entertainment solution that can perform as well in the living room as it does in the study.

### Shall we play a game?

Before Windows 95 came along, playing games was something you did in DOS. Even after Windows 95 was released, the best games continued running in DOS for some time until Microsoft's DirectX programming interface finally enabled developers to design decent games for Windows. DirectX3, you may remember, was glitchy and didn't work on everyone's system. For the past year or so DirectX5 has been the standard and it's holding out pretty well. If you've played any of the games on CD Review, you'll probably have it running on your system.

When games developers program with DirectX they don't need to consider all the various different hardware configurations you might have in your PC. With Microsoft encouraging hardware developers to build their graphics cards, sound cards, modems and joysticks to the DirectX standard, programmers can write games that talk directly to your kit, no matter what brand it is, through Windows.

While Windows 98 comes with the full complement of DirectX5 drivers, Microsoft plans to release DirectX6 very soon. However it's somewhat disappointing for gamers to see that Microsoft has failed to have DirectX6 ready in time for Windows 98. It makes us wonder if the company is really serious about making Windows 98 a single disc entertainment platform?

DirectX5 has proven to be robust enough, but new hardware developments are leaving it behind, particularly in the realm of 3D graphics. A whole host of new AGP graphics chips are due to be launched this summer and to get the very most from them you'll need DirectX6. Despite what Microsoft claims about enabling bigger and better features in games – like 3D graphics, 3D sound, Internet connectivity and so on – Windows 98 will be on a par with Windows 95 for gaming quality. Both Windows 95 and Windows 98 users will be able to install DirectX6 in July. As far as we can tell, Windows 98 won't be essential for gamers, and we know of no game in development at this time that is Windows 98-specific.

### Multiple Monitors

Attach nine monitors to your PC? Why on earth would you want to do that? At least, that's what we thought when we heard that Windows 98's MultiMonitor function enables you to run that many screens on one PC. However, the possibilities are intriguing. MultiMonitor may add a whole new dimension to your gaming. Playing *Flight Simulator*, for instance, you can open a window displaying an external view of your plane and drag this onto your spare monitor. Alternatively, if you have several



above: If you think the effects in *Forsaken* are good, wait until you experience DirectX6 – the upcoming games development platform famously left out of Windows 98 because it's too late.

right: *The Usual Suspects* (Polygram) is one of around 100 DVD movies to be released. Discs cost £17.99 at the moment.



below: Ubisoft's fantastical platform game *Tonic Trouble* will ship on DVD and has an awesome intro sequence with full Dolby Digital surround sound.



monitors, you can do the same for back, left and right views and build a virtual cockpit around yourself. Imagine what it could do for games like *Forsaken*, where different views are currently displayed in small windows in the corners of the screen.

MultiMonitor has drawbacks, however. Currently, you need a graphics card for each monitor you plan to run. In the future, though, graphics cards will come with more than one video-out socket enabling you to attach two or more. ATI already has a card in the pipeline. Secondly, a game must be designed on a Windows system in order for this to work. You can only drag bona fide Windows windows to your extra monitors. That's why multimonitor support works with *Flight Sim* (which is Windows through and through) but not with *Forsaken* (which has its own system for displaying rear and side views).

Many people who have upgraded their monitors and/or graphics cards will probably still have their old ones lying around and will therefore be tempted to put them to good use. And MultiMonitor support is very useful beyond gaming. Plenty of graphics and music packages require you to have numerous palette and tool windows open, as well as the file you're working on. To make creativity easier, you can keep all your tools on one monitor and the main application window on the other. If you're painting a picture or writing a letter, you can have several drafts open at once to compare side by side. Web designers can use two or more screens to view their pages at different resolutions.

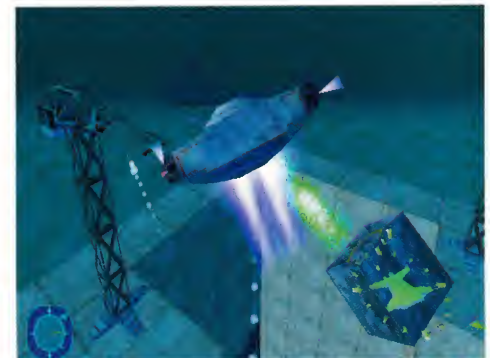
MultiMonitor will also have more than one full-screen application open at the same time, so you can read email while you browse the Web. You can even drag documents across from one screen to the other. MultiMonitor is one of those gimmicky applications you never even thought you'd need and we can't see everybody using it. But if you've got the space and the money, why not?

### DVD for all

You'll have heard about DVD by now – it's a key component in the future of PC-based entertainment. A single DVD stores an entire movie in high quality

MPEG2 video format, complete with a Dolby Digital surround sound and subtitles in several languages. As DVD discs can store between 5GB and 18GB of data (compared to only 650 on a CD-ROM), DVD-based games will be bigger and better. You'll see more FMV sequences, enhanced graphics, far more music and surround sound. The days of adventure games coming on five discs should be over – at least for a year or two.

To play a DVD movie or game, you need a DVD-ROM drive and a decoder to decipher the video, which is compressed in the MPEG2 format. The decoding can be done in software on a PentiumII, but it's better to use a dedicated hardware card so the video processing doesn't stress your system too much. And this is where Windows 98 comes in, providing software support for decoders from Toshiba and Luxenor, although you can still install software for a different make of DVD drive. There's a DVD Player console in the Windows 98 Accessories menu with play, fast forward and rewind buttons much like a VCR. It's handy but hardly essential because movies on DVD will come with bundled software players, which may be required to access specific features on these discs. It's PC Review's feeling is that Windows 98 is hardly essential for DVD.



above: *Psygnosis' Lander* will be one of the first DVD games to arrive, but if you've got a DVD drive and Windows 95 it will still work.



# MICROSOFT WORD

We've had our say, now **Microsoft's David Weeks** addresses our concerns. **BY GARRICK WEBSTER**

**B**eing an objective and impartial journal, PC Review has decided to give Microsoft its say on Windows 98. We took a trip down to London to meet up with David Weeks, who is the product manager for Windows 98 in the UK. A thoroughly friendly chap, after demonstrating Windows 98 to a gallery of hacks, he sat down with PC Review to answer the questions that had to be asked. This is what he had to say...

Windows 98 isn't all that different from Windows 95, is it? It just doesn't seem as substantial as the move from Windows 3.1 to Windows 95.

No. Nope. No it's not. It's three years down the line. There's three years worth of development in there. We've moved more of the 16-bit crystal code to 32-bit code and I would say that all the features are under the hood features, apart from the *Internet Explorer* integration. I can't say like I did with Windows 95 there's one key feature, like the user interface, that has changed dramatically. The sum of the parts is

**"The sum of parts is greater than the whole. There's going to be a lot of features that people are going to want to utilise, and these are going to relate to a lot of user group segments."**

greater than the whole. There's going to be a lot of features that people are going to want and utilise, and these features are going to relate to a lot of user group segments. Anybody who has started using it has come up to me and said, 'I like this product. I don't know why I like it, but I like this product. It's faster.' Maybe it speeded up the way they work, but they like it.

**Can you really guarantee everyone a 30 per cent performance boost when booting up a program in Windows 98?**

Yup. That's the test. You'll probably get faster speed performance in a lot of machines, but in testing that's what we got. It is 30 per cent faster, but it has to be FAT32 to get that speed performance. The cluster size is part of the way the optimisation works. If the user doesn't want to go to upgrade to FAT32, and wants to stay with FAT16, they will get a 10 to 15 per cent speed improvement.

**Can you guarantee people will have fewer crashes in Windows 98?**

Yes. It's a lot more robust and it's much better in its capabilities – the way it manages the memory. The memory doesn't access the wrong commands so much. If you do get a blue screen – and a lot of the time you don't know what causes the problem – there's something in there called Dr Watson which should kick in. Dr Watson will actually give you a log file and tell you what application is causing the crash. If it's a constant issue, it could be Windows, or it could be an application that's conflicting with another application that's causing all these corrupt issues. With Dr Watson you'll be able to isolate it or reinstall the program or whatever to make it more robust.

**Do you think that with Windows 98 people will find themselves able to spend less money on diagnostic utilities and what not?**

Definitely. Without a doubt. I mean, there are so many tools in there. We've got the System File Checker. There are system utilities in there that give you a global resource of everything. There will be Dr Watson in there. You can go in and configure your software configuration, your hardware configuration. There's a system management console, and all your tools are available from there. Anybody who's fairly technical and has a good to average understanding of PCs will be able to manage their PC from one place rather than going around the houses. You can change what you load from start-up by ticking a box. You can click all these different utilities. It's really fantastic.

**Some of our readers have written in concerned about Windows 98 and its Net connectivity. The idea of our desktops extending to reach the entire Internet at the click of a button is visionary, but some people are worried they might inadvertently connect to the Net. Will this be the case, and how clear will the separation between the Net and the everyday desktop be?**

Very clear. If you haven't got an Internet connection live, when you click on a URL it will load your Connection Wizard up and ask you if you want to connect. So, you can say, 'Oh, I don't want to do that.' It's not going to automatically do it in the background down your phone line – it will not do that. It will actually ask you to enter your log-in password to whatever Internet provider you use.



*David Weeks is Microsoft's man in charge of bringing Windows 98 to the market here in the UK.*



If you've been online and you go back to working on the desktop, will you stay online and continue to clock up charges?

Yes. But you'll also obviously have settings within your dial-up connection saying that if no data is being passed or you haven't interacted with the Internet then it will automatically disconnect. You can set that time parameter yourself. Once you're connected you stay connected, but there's a very clear box on the bottom of the taskbar showing the connection. It is very visible. It's not just hidden in the background, you actually have a connection icon there.

**It was rumoured that for PC musicians there would be a software synthesiser included in Windows 98. Is that true?**

It depends on the actual soundcard you've got. It is in Windows 98 but it is installed as part of the drivers and activated depending on whether the soundcard can utilise that functionality. If you're using a Yamaha or a Creative Labs soundcard which happens to have synthesiser capability it actually wakes up on your sound control panel a synthesiser button. We have digital support in Windows 98, so USB support and digital sound support make this capable. We've got MIDI support in there.

**Are we going to see a substantial improvement of the Uninstall facility in Windows 98? In Windows 95 it was rather unreliable.**

There are a lot of improvements. There are features within the Maintenance Wizard which will do a lot of the work for you, and it's a lot cleaner. If you're downloading files, a lot of the setup files are dumped in your Temporary folder and they just clog it up. Some users just don't know where to go and will get 60, 70, 80, 90MB worth of files just sitting in there. The Maintenance Wizard will clear all those out for you. So it's a lot more efficient at cleaning up and keeping your system running at its optimum.

**Looking at the MultiMonitor feature, when do you expect the first games that take advantage of this to come out?**

Well, obviously, *Flight Simulator* is available today. Games will have to release windows in order for them to be dragged across to the other monitor. We have a DirectX evangelist working in Europe. He is working with all the games companies and obviously evangelising the DirectX technology and Windows 98. We expect to see a couple of games out around Christmas time.

**Will MultiMonitor mean that two people will be able to play a game at once on a single PC?**

With the USB and a fairly new machine you should be able to do that. That's what our games developer evangelist is working on right now. It takes 18 months for games to be developed. They're working on beta code right now so hopefully we'll see a few games appearing around Christmas that start utilising all these smart features.

**In some of the Microsoft literature it says you'll be able to download Web content without tying up a phone line. What feature is this?**

That is part of the enhanced WebTV capabilities that the guys in the United States have employed. In the UK it doesn't make the cut because there are still standards being talked about with the broadcasting companies at the moment. Unfortunately we haven't got the standards.

**How long do you think it will be before you start seeing Windows 98-only applications?**

The *Plus!* pack is a Windows 98-only application (see *Windows 98 Plus!*), but specific Windows 98 applications? It's very much a hardware release so it is

## Microsoft and the Law: Comment

You'll no doubt have heard something about Microsoft's increasing legal difficulties surrounding its position in the market and Windows 98. As PC Review goes to print the company faces anti-trust suits from 20 US states, plus the District of Columbia and the Federal Department of Justice.

As owner of the operating system we use on our PCs, Microsoft is seen to be in an unfair position. With the integration of *Internet Explorer* in Windows 98 it's feared that companies producing other Web browsers will be severely damaged. On the face of it, this seems a little odd. Preventing Microsoft from improving Windows by adding a browser would be like stopping Macdonalds from putting cheese in its burgers just because that might put the poor sandwich man out of business. It's a totally preposterous intervention that inhibits innovation.

The bigger picture, however, concerns the rise of e-commerce. It's thought that if Microsoft controls Web access software, the company will then use this position to direct Internet users in the direction of Microsoft's commercial sites such as the travel site, Expedia.

This worry overlooks two points. Firstly it assumes consumers like us will mindlessly follow Microsoft links without doing any thinking or

investigation on our own. Will we really be overcome with a burning desire to book cheap holidays with Expedia just because we Browse with IE4, or will we simply continue to buy according to price and convenience through an independent site?

Secondly, though the Web is getting more commercialised even as we speak, it still works in the same fundamental way. The great thing about it is you CAN find what you want quite easily without being led by the hand by some megacorp. Indeed, in many ways that's part of the fun. If you're having difficulties, impartial magazines like PC Review have regular Net reviews helping you find the hot stuff.

If things don't go its way Microsoft may ultimately be broken up. We think the result of this would be utter chaos for PC users. Could Intel be next? As we go to print, however, David Weeks assures us Microsoft is working towards a successful resolution with the Government and that Windows 98 will be available on June 25. We've even been invited to the forthcoming launch party. If this is just posturing from the company and the release doesn't come off, shame on them. Either way, we hope you find this feature provides useful coverage and advice relating to the product.

**"There's a system management console. Anybody who has an understanding of PCs will be able to manage their machine from one place rather than going around the houses."**

enabling a lot of the hardware's robustness. It has full backward compatibility, so people are designing for Windows 95 today and all these applications will work on Windows 98. And they will probably continue to develop for Windows 95.

There won't be so many specific applications for Windows 98, there will be enhancements to applications which utilise the features in Windows 98. I wouldn't say there are going to be Windows 98 specific applications on the market.

**Ever?**

Ever? In the short term, no. In the short term there's going to be a lot of people who stay on Windows 95. There's going to be a lot of people who move to

Windows 98. Software vendors don't want to isolate that part of the market because it's obviously a valuable source of income for them. Having said that, there will be enhancements to a lot of products that come onto the market. For example, *Encarta* takes advantage of DVD, so if you've got DVD support rather than little postage stamp video you've got full screen DVD. But if you haven't a DVD player, you can still get the AVI content.

**Why is DirectX6 not included with Windows 98?**

The simple reason is that DirectX6 is still under development, it's still in beta.

**Okay. Why wasn't DirectX6 finished in time for the release of Windows 98?**

We would have loved it to be included in there. The development is coming along, there will be updates for it and it will be available through the Windows Update Manager.

When NT4 came out there was a lot of speculation that the next Windows for home users would be more like NT than ever before. This doesn't seem to be the case...

Under the hood there's something called the Windows Driver Model which is compatible with NT5. NT5 will start using the Windows Driver Model so that we have one driver model for hardware and software, so developers rather than having to write two sets of drivers can write one set – for Windows 98 and NT5 when it comes out.

**Is there any other under-the-hood stuff for us to look out for?**

There's dial up networking so that connecting to the Internet is a lot more robust connection in there. There's auto reconnect so if it goes down half way through when you're downloading information it will auto reconnect for you.

You've also got support for multichannel aggregations, which is the ability to have two phone lines going in and two modems. So, if you've got two 56K modems you can get 112K, which is faster than ISDN, so we do the multichannel aggregations – you need two phone lines, but you can get data faster. Pop it straight in there and you get double the speed. (Note: actually ISDN is faster at 128K.)



# SHOULD YOU UPGRADE?

**Verdict:** PC Review sums up the evidence and passes final judgement on Windows 98.

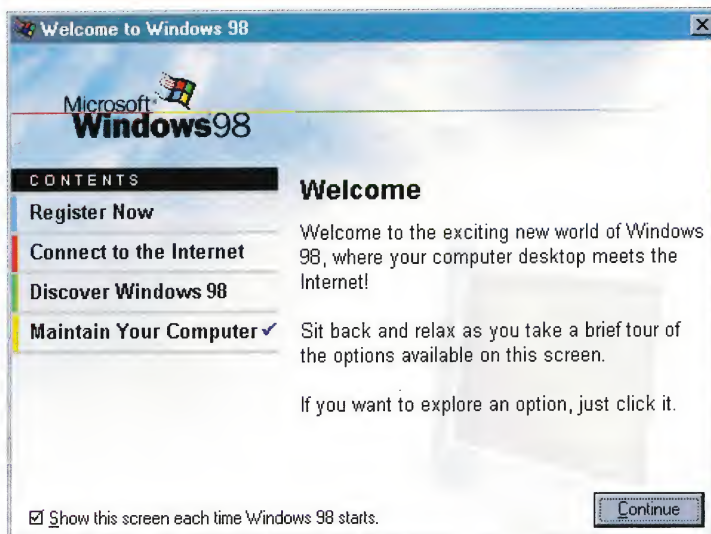
Here at PC Review we've actually been using Windows 98 for over a month now, and in that time we've discovered several things. As Microsoft claims it is more robust than Windows 95. Indeed, we've had very few crashes and when our machines have crashed this has usually been down to buggy software rather than the new version of Windows. We've also found we have more hard disk space free and the system really does work a touch faster than before.

Making the upgrade is certainly worth it if what you're after is pure performance gains. And it has without doubt taken more strides towards becoming a self-maintaining system with the welcome inclusion of the diagnostic tool, Dr Watson. Money currently spent on all manner of external diagnostic tools can now be invested in an extra game or creativity package, and that can only be a good thing.

However, the only other main reason to do it right away is if you have a new PentiumII PC with a Universal Serial Bus (USB). The USB is rather difficult to get working under Windows 95 but runs along a treat under Windows 98. With it many new hardware horizons will be open to you to Plug and Play to your heart's content.

Apart from in these two areas, Windows 98 won't be massively important to you, particularly in the short term. If you're already happily using the Internet, then Windows 98 won't do much for you other than add a few more peripheral bells and whistles. A Web-style interface you can easily live without, though it has to be admitted the online help and updates are handy services to have available.

Your games, for the most part, will work just the way they did under Windows 95. The MultiMonitor function sounds like an intriguing prospect for gamers in the future, but apart from Microsoft's own *Flight Simulator* there aren't any games at this time to take advantage of it. Similarly, the failure of DirectX6 to make the cut is a big disappointment. Yet this too will be available for both sets of users later in the year.



left: *Like it or not, Windows 98 is here. Microsoft extends to us a warm welcome which PC Review accepts with a slight air of indifference.*

**We're positive you should make the upgrade to Windows 98, but firmly believe you can safely do this anytime between now and Christmas without missing out on anything significant.**

The first generation of DVD games, such as the eagerly-awaited *Lander* from Psygnosis, are drawing nearer. However, as we've already observed, if you're in possession of a DVD drive and Windows 95 then you don't need Windows 98 to get DVD to work.

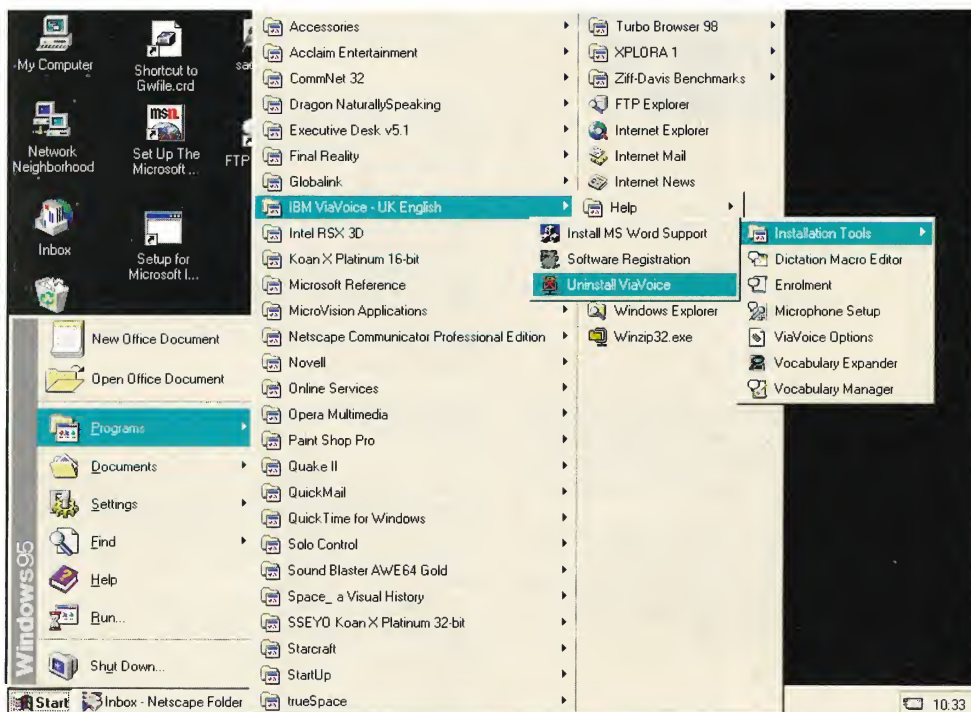
Don't get us wrong, we're not jumping on the anti-Microsoft bandwagon here – Windows 98 is far from useless. It's a good, compact, sturdy, feature-filled operating system that's easy to use and maintain. Another good point is that it will work on any Pentium with 32MB of RAM quite easily. Because of this, Microsoft has made the claim that this new operating system breaks the Wintel cycle, under which a new operating system would push users towards a new processor (more expense), and each new processor would encourage the development of another operating system (yet further expense). Windows 98 will work on just about every PC out there at the moment, but it hasn't really cracked that so-called Wintel cartel. To get the best performance from Windows 98 the latest processor – a PentiumII system with all the extra hardware support it offers – is definitely recommended.

We reckon that the vast majority of users will simply not need to rush out to the shops and buy Windows 98 right away. PC Review takes a longer term view of things. We're positive that you should make the upgrade, but we firmly believe you can safely do this anytime between now and Christmas without missing out on anything.

If there's a new game you want, by all means go out and buy it. Don't let Windows 98 make you miss out on something you can enjoy today. Similarly, if you have your eye on a new piece of shiny hardware we wholeheartedly think you should go for it and start using it. Take our word for it when we say, Windows 98 will still be on the shelf in a few months time and you can buy it then. On the other hand, if you're thinking of buying a PC you should hold off until Windows 98 is shipping on new systems. That way you won't have to muck about with the installation, and you'll save £90.

We think Windows 98 is a massively important development in the evolution of the PC. In our thorough tests we've discovered on the whole it is a very good thing. It's not quite the new dawn of personal computing you might have expected. Then again, Windows 95 claimed to be a new dawn but turned out to be a painful one for many users.

So welcome to Windows 98. **PCR**



above: *We're saying a fond farewell to Windows 95, but Windows 98 really isn't that different.*



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# games review

Seeking **originality**, innovation, **great graphics** and **sound gameplay**? This month we review 21 games...

## STARCRAFT

A stellar jewel in the real-time strategy crown or **simply orcs in space**?

BY GARY TIPP



**S**tarCraft has been a long time coming. In the time this game has taken to reach our monitor screens, some third world military leaders have planned a coup, fought a bloody civil war, taken power, passed unjust dictatorial reforms and then been deposed. A number of boy bands have formed, had a string of number one hits, developed bad habits and then acrimoniously disbanded. Leo Tolstoy could have bashed out the sequel to *War and Peace* on his word processor, sold the movie rights and looked on in disgust as Bruce Willis was cast in the lead role. As you may or may have not got the message, the term 'long-awaited' is wholly applicable to Blizzard Entertainment's *StarCraft*.

Delayed longer and later than the 7.15 to Paddington, the game was set to be with a suspecting public as far back as last summer. Yet, sticking to its metaphorical guns, Blizzard went all Magnus Magnusson on us – it'd started and so it would finish. And finish on its own terms the game's developers did.

Another and possibly more pertinent reason the game has been long-awaited by gamers is that, up until now, the fruits of Blizzard's labour have all been very special indeed. For starters, there's the soon-to-be sequelled *Diablo*, its hack'n'slash RPG is a much-loved biggie in the good versus evil world of multi-player gaming. On the other claw, there's the direct predecessor of *StarCraft* and many

people's all-time favourite, the seminally wonderful *WarCraft II*. The latter is a real-time strategy game straight out of the top drawer, with more charm in one of its character's little appendages than the entire *Command & Conquer* series. Gamers can be devoted to a developer like a pre-pubescent girl to her little pony and, believe us, *Blizzard* inspires more heartfelt loyalty than most.

### Terran's all gold

So was the procrastination worth it? Does *StarCraft* live up to the other members of its esteemed lineage? Hell, yes. What we have on our hands here is one of the most playable and utterly addictive real-time strategy games to land on our easy-to-assemble mock pine desks in many a month of Sunday supplements.

Where *WarCraft* was set in a wooded and mythical world of grunting Orcs and noble humans, *StarCraft* has upped sticks and moved to the universe beyond earth's atmosphere – namely space.

And here we stumble upon what is *StarCraft*'s greatest advance from its predecessor. Not surprisingly, you find the game's world in a time of crisis – but where you found only two opposing factions in *WarCraft*, in *StarCraft* you have three. This powerful trio of races are all in direct conflict and each one has total galactic domination on the menu. Initially this may not sound like such a big deal, after



## Loving the aliens – meet the cast

Let's take some time out to meet the cast. In one corner we have the nomadic Terrans. These space-bound humans are masters of survival forced to live on the mostly lifeless worlds along the Galactic Rim. A harsh existence, believe us. Along with their mightily pleasing Siege Tanks (great noises) and particularly goofy Explorer Science Vessels, the Terrans possess the handy knack of being able to lift up their primary structures and set them down again in a more favourable or less hostile environment. Flexibility is the key to the Terran success.

Being an insectoid race it's kind of understandable, but the insatiable Zerg are not overly fussed with technology. They rely on sheer weight of numbers to overcome their opponents, couple this with the ability to burrow and they cut an impressive if not rather ugly profile.

Many a time you'll find yourself gaily wandering around the fringes of a Zerg encampment only to be suddenly surrounded by a ravenous throng.

The third race is something altogether different again. Named the Protoss (George Michael anyone?), they possess highly advanced technological weaponry and potent psionic abilities. Unlike the Zerg, there's not a whole bunch of them but the one's who do exist are never to be underestimated.

Throughout the course of the game you'll encounter all three of these alien races. And through this process your allegiances will no doubt change. First up, you'll love the Terrans for their gutsy approach and array of weapons. You may even begin to sympathise with the insect-like Zerg and, finally, you'll admire the techy splendour of the Protoss.



above: The Terran air forces have developed cloaking: this obscures sight of your aircraft from the enemy (albeit for a limited period).



above: Strategies are all well and good, but you still can't beat a good scrap.



above: Overkill perhaps, but it's possible to build up armies of immense proportions.



right: The Mission Scenarios offer a certain variety. Here you must ensure the Battleship survives.

right: The Mission Editor comes wholly recommended. Finish the game and then pay it a visit. You'll be hooked.



above: Blizzard has not skimped on the art work and StarCraft is often a real pleasure to gawp at.

all, two can be company and three's quite often a crowd. Yet when you discover these species all possess their own unique strategies, vastly different technologies and specialised abilities, you know you've got more than just a smattering of gameplay at your disposal. And this is the case both in single and multi-player modes.

The three races in question are the Terrans, the Zerg and the Protoss – you'll get to love and loathe each one of them in turn (see the 'Loving the Aliens' box above).

Despite this innovative and more complex approach to gameplay, the three races are all expertly and evenly balanced. This is obviously no coincidence, but is still a major achievement on Blizzard's part: there's no killer strategy or weapon which makes one side invincible. The Protoss may be the strongest race in the Universe, but they will succumb to a swarm of Zerglings like the rest of us. Similarly, the Terran Siege Tanks may seem pretty invincible, but attack them from the air and you'll soon rid the map of them.

### Move over Zergling

The single-player mode features 30 missions (ten per race), and you're strongly encouraged to play them in the suggested order. This facilitates the integrated storyline and Blizzard has gone a bundle on making the experience as cinematically involving as possible. As with *WarCraft II*, the animated cut-scenes are of the highest order and a pleasure to idly gaze upon. However, *StarCraft* drives the narrative deeper into the imagination with a greater reliance on identifiable characters and some neat interaction within the actual field of play. This can be seen either as an essential diversion or an

**Serious PC Gamers can be devoted to a developer like a pre-pubescent girl to her little pony and, believe us, Blizzard inspires more heartfelt loyalty than most.**

irritating intrusion, depending on your own personal preference. Yet there's no doubting there is story-telling of no small invention afoot.

In the style of *WarCraft II*, the missions get progressively more complex, and so more difficult to complete as they progress. This helps you get to grips with the variable mass of technology available to your fingertips and enables you to gradually identify what you hope are winning strategies.

Unlike, say, *Total Annihilation* or *Command & Conquer*, *StarCraft* doesn't offer a seemingly inexhaustible list of micro-management decisions. Yes, there are lots of units, structures and the like, but not so many that you'll need a photographic memory to be able to utilise them all fully. It's all about getting that balance right.

Another point of note to the solo mode's credit is *StarCraft*'s approach to mission objectives. No longer is there the over-reliance on relentlessly building up an army and beating the hell out of the artificially-not-that-intelligent foe. Missions include covert operations such as assassinations, and there's even one scenario which challenges you to 'survive for half an hour'. This kind of imaginative task setting is most welcome.

If you were looking for flaws, then you could complain that

continued over





left: Make sure not to give offence in multiplayer games, or you may find yourself picked on.

below: Siege tanks are one of the Terran's deadliest weapons.



left: The mission scenarios dictate you keep certain characters alive. Here you should keep an eye on the little green fella.



left: One of the Zerg's greatest weapons is the rather handy ability to burrow. Now you see them...

right: ...and now you don't. The subterranean Zergs will now lie in wait for an enemy patrol.



## Multi-player StarCraft: the office of death

First impressions are lasting impressions, and *StarCraft* has put a strange lop-sided smile on the collective faces of the PC Review team. And here's why...

Name: Garrick Webster  
Favourite Race: Terrans

Job: Editor  
Favourite Unit: Cloaked Wraith

Handle: Webster

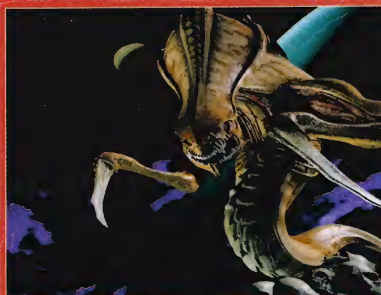


Looking back across the years I've enjoyed *Dune II*, *Command & Conquer*, *Red Alert* and *Total Annihilation* in single-player mode. What annoys me about most real-time strategy games in multi-player mode is the absence of strategies. The winner is the one who can build the most tanks the quickest and execute the infamous 'tank rush'. Being a player who likes to build, fortify and strategise before going on the offensive, I like *StarCraft*'s multi-player mode. There are several devious ways of outsmarting a tank rush in this one. I haven't found a strategy for dealing with Mr Tipp, though. Not yet...

Name: Graham Southorn  
Favourite Race: Zergs

Job: News Editor  
Favourite Unit: Zerglings (they're so cute)

Handle: Mr Blackmore



I don't play many strategy games, so what impressed me most about *StarCraft* was that I could sit down and go to battle more or less straight away – certainly without looking at the manual. I was given the insectoid Zerg race to command, and despite their complex abilities like mutating and building hives, I quickly learned how to assemble a half-decent fighting force. I even wiped out my editor with fearsome flying Mutalisks, although to be fair he was on the phone at the time. Like *Red Alert*, the bigger the force the better your chances and the Zergs were eventually squished by Gary Tipp's yellow and black army. But as Arnie said, I'll be back.

Name: Gary Tipp  
Favourite Race: Protoss

Job: Deputy Editor  
Favourite Unit: Reaver

Handle: Stagger Lee



Despite never buying into the *Lord of the Rings* malarkey, I am a big fan of *WarCraft II*. Like many, I've been idly twiddling my thumbs waiting for *StarCraft*, and was cock-a-hoop to see it finally arrive. Call me easily pleased, call me anything you want to, but I'm happy with about every aspect of the game. As soon as I began to play, it was like welcoming home an old friend. My network games, so far, against the other PC Review staffers have gone well. I put this down to a cunning piece of real-time strategy – I'm the only one who possesses the instruction manual. As they say, it's the winning that counts!

## LOUNGE BLIZZARD

Battle.net is Blizzard Entertainment's Internet gaming service. It enables real-time strategists from all corners of the globe to rage war against each other using Blizzard games, such as *StarCraft*, *WarCraft* and *Diablo*. Battle.net also supports a world-wide ranking system, enabling you to test your skills against comparable opponents. The connection is just a click away if you own a copy of the game. Once connected, you can chat with other players to arrange, create, join games and, inevitably, lose. Best of all, Blizzard is too nice to charge and the service is free.

*StarCraft* is not pushing (let alone licking) the real-time strategy envelope as far as innovative advance is concerned. Yes, there is high-ground and cover, unlike *WarCraft II*, but the 2D terrain is relatively flat, as opposed to popular RTS games like Activision's *Dark Reign* or Cavedog Entertainment's *Total Annihilation*. But this technological limitation doesn't harm the gameplay a jot.

Similarly, the look of the game is instantly recognisable to fans of previous Blizzard offerings – but this too is not a disadvantage by any means. The game's colours are vibrant, the animation is fluent and there are a great number of appealing translucency effects. The 3D models used for the buildings are very convincing, and the multiple stages they progress through while under construction are just the right side of realistic.

The explosions, of which there will be many, are also just right. The individual units all cut a fine figure – and while smaller than in *WarCraft II*, they still manage to possess a charm of their own. You may not be moved quite to tears, but the loss of an individual unit can still cause the smallest of lumps in the throat. Sounds too are very impressive. The Terrans and Protoss may speak your language (approximately), but the hissy bug-like cackle of the Zerg could have you scratching your dry, flaky scalp in utter bewilderment.

## R U Protoss?

The game in multi-player mode is another thing altogether, and the introduction of three unique alien species dramatically increases the strategic fun to be had in the virtual skirmishes by quite a phenomenal extent. That's if the anguish of getting seven shades beaten out of you can be described as fun.

With the two sides possessing equal resources and both sides probing for weaknesses, multi-player *Warcraft II* could be looked on as a game of chess. While still holding onto that cerebral edge, *StarCraft* is far more dynamic. The fact that the three aliens races all

play so differently adds an extra dimension to the gameplay, not to mention an unholy plethora of offensive and defensive strategies.

One often overlooked gem of Blizzard games is the Campaign Editor. For the totally devoted gamer with a bent for do-it-yourself few days to spare, the ability to create maps (and hence campaigns) is a positive boon. This adds untold life to the game. The Mission Editor is suitably easy and flexible enough for most to use. If, however, you're feeling a bit lazy and can't be arsed, there's always a case to be argued for simply downloading other people's handicraft off the Internet. Within a folder named Custom Games, *StarCraft* itself holds ten customised games to illustrate just what is possible. Longevity and value for money are simply not a problem when it comes to the mighty *StarCraft*.

More than worth the wait of the indeterminably long delay, *StarCraft* has everything the fans of the real-time strategy genre are looking for. Addictive and challenging scenarios, backed with an involving story-line add up to a great real-time gaming experience in both single and multi-player modes. What more could you want? Reach to the stars and make this gem of a real-time strategy game yours to have, hold and, most of all, play. Take our word for it, *StarCraft* is better than fun. **PCR**

Developer: Blizzard  
Publisher: Cendant

Contact: 0118 920 9100  
Price: £34.99

Recommended system: P90, 16MB RAM, double-speed CD drive, Windows 95

**For:** Addictive gameplay, and three species makes it special

**Against:** Hard-core gamers may want more technological advances

**nine out of ten**



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right: Meet Red Lotus, the anatomically suspect co-star of *Deathtrap Dungeon*.

below: The multi-player mode even puts the emphasis on decapitation.



below: Maybe Eidos is starting a new 'co-starring the T-Rex' trend with its games. Can't wait for the next *Flight Unlimited*...



# DEATHTRAP DUNGEON

Eidos' famously delayed blockbuster arrives, but has it been worth the wait? **BY MARK RAMSHAW**

Last issue it was *Die By The Sword*, next month it'll be *Unreal*, and this month we have *Deathtrap Dungeon*. This is obviously the season when those games in development far far more years than is healthy come out to play. Big things are expected of *Deathtrap*, not least because Eidos has hyped the game a ridiculous amount for the last year or so, even drawing comparisons with *Tomb Raider* via a buxom female character by the name of Red Lotus. In fact Miss Lotus is no match for the mighty Lara, lacking that indefinable appearance of character, not to mention looking like far more amateurish and crass. Is a skintight, crotch hugging red leather one-piece really necessary? No doubt catchlines about sexy warriors wielding big choppers are just around the marketing corner...

Really though, the appeal (or lack of) Red Lotus is of next to no interest to the average gamer. Far more pertinent is the way Ian Livingstone's fantasy creation has been transformed into a living, breathing (except for the skeletons, zombies, and other undead nasties naturally) game world. Bizarrely *Tomb Raider* is again the

initial reference point. Whether this is a case of Eidos building on a genre it created or competing against itself is debatable. But there's no mistaking the use of a third-person roving camera, the blend of platform action, puzzle solving, trap avoidance, and bad guy beating. There's even a T-Rex lurking in there, just to further that *deja vu*.

By building on an established format, *Deathtrap* is free to experiment with the fantasy theme safe in the knowledge that many of the game mechanics will work. Unlike *Die By The Sword*, which put fighting before exploration (then fell down because the implementation of swordplay was wrong), *Deathtrap Dungeon* is just as much about finding the right switch, or the gold key as anything. In fact, as rudimentary as these building blocks are, the puzzles are frequently a delight, with all manner of sliding walls, blocks, descending ceilings and other bits of transforming architecture lending the game real substance. Even Lara's adventures fail to get quite this cerebral.

While the presentation feels formula, in play *Deathtrap Dungeon* feels quite different from Eidos' other blockbuster, thanks

## I walked with a zombie

Having the dead rise from their graves is just the start of a hero's troubles in the dungeon. There's much worse to come...



above: Skeletons look formidable, but tend to fall to pieces when provoked. Well, they are just a bag of bones.



above: Undead jesters and snake women, on the other hand, have strength in numbers. As you'd expect.



above: The creatures, like the weapons, get bizarrely futuristic as the levels progress.



above: But there's always the odd giant clawed dragon just to keep players on their toes. Ouch!





right: 3D cards are served well by the various spells, though even in software mode such effects are lavish.



above: We knew those asbestos wellies would come in handy. The action ranges confusingly blends the grainy and gritty...



above: ...with the outright garish. Here we see the latest effort from the Changing Rooms team, perhaps?

right: There are some inspired level designs, including this Pratchett-esque scene.



## By building on an established format, *Deathtrap* is free to experiment with the fantasy theme safe in the knowledge many of the game mechanics will work.

largely to the use of melee weapons and spells. Certainly the early stages of the game, where swordfighting is the only way to beat the enemies into submission, pose a challenge all of their own.

Later stages do curiously put flamethrowers and other ranged weapons into the medieval hands of Lotus or Chaindog, the alternative male hero of the adventure. But while such cyber-medieval touches do take something away from the flavour of the proceedings, they do help to provide an escalation of power and variation in combat style – pretty necessary given that the designers have packed in 21 levels. The spells are obviously a little better themed, though their role remains underdeveloped. This certainly isn't the sort of game to satiate hardcore Dungeons & Dragons fans. But then that's not necessarily a bad thing.


### It's a deathtrap, man

Graphically, *Deathtrap Dungeon* presents something a mixed bag. It's certainly one of the more respectable 3D titles around, it looks almost as good without a 3D card as with (though a hefty CPU is needed instead) and packs in the requisite number of tricks such as real-time lighting on characters, and translucent explosion and spell effects. But while some locations are beautifully realised, there are a number of environment textures that are simply too garish or flat for a dungeon-based game, and the monsters tend toward the cartoonish. This is obviously the intention, the imps even utter Beavis And Butt-head-style grunts when they attack.

But perhaps the oddest aspect to the visuals is the use of the third-person viewpoint. There are times when *Deathtrap Dungeon* succeeds in really pushing the idea further than any other game, the habit of switching from a regular tracking mode to more dramatic angles for key events or real-time cut-scenes showing just how cinematic it's possible to be without having to resort to FMV.

But like so many new titles attempting to employ a third-person viewpoint, the designers have failed to design the levels to accommodate it. Tight tunnels, and low-ceilinged rooms mean players get anything but a comfortable vantage point. And even in larger locations, backing against a wall or two has the usual effect of turning the game into a handycam approximation of an MTV video. All fine and dandy when there's only exploring to be done, but just a touch more awkward when attempting to battle it out with a bunch of evil-doers. Particularly when the stodgy rotational controls make using a sword, or most other weapons for that matter, finicky at the best of times.

There's a strange mixture of invention and regression here. Despite arriving around two years after the first *Tomb Raider*, the designers have managed to come up with a less satisfying control system, and a method of combat that never really offers scope for tactics or even much in the way of precision – something that you'd expect to be crucial in a game that pits a lone hero against over 40 different monsters and beasts. Yet the environments are frequently inspired, the puzzles and traps among the best ever committed to computer memory, and fantasy themes playful and refreshingly free of hit points and other such nonsense.

Not the new *Tomb Raider*, then. And, despite what the crazy delays and massive investment may suggest, not an especially ground-breaking or flawless creation. But a surprisingly more-ish romp, nevertheless, with more than enough in the way of impressive place to explore, problems to solve, and monsters to dice than any fantasy fan could hope for. And probably the only medieval game to feature imps that attack while sat inside giant green boots, too. A humorous game set in a dungeon – whatever next? 

Developer: Asylum  
Publisher: Eidos

Contact: 0181 636 3000  
Price: £39.99

Recommended system: P166, 16MB RAM, double-speed CD-ROM drive, Windows 95 Supports: 3D card, Net play

For: Great puzzles, a good range of weapons, spells and monsters

Against: Awkward remote viewpoints and controls

**eight out of ten**

### LIVINGSTONE, I PRESUME

*Deathtrap Dungeon* is based on the best-selling series of fantasy books of the same name. These interactive stories have sold over 15 million copies in total, making author Ian Livingstone, a household name amongst fans of swords and sorcery. That Eidos has the rights to *Deathtrap Dungeon* isn't any great surprise, as Livingstone happens to be the chairman of the company.



right: The US soldiers don their thermals ready to fight it out in north Korea.

# SPEC OPS RANGERS ASSAULT

Zombie's soldier simulator hits the ground running. BY MARK RAMSHAW

There's something irresistible about the idea of donning a uniform, slapping on the facial camouflage and heading off into a warzone with nothing but a few grenades and a semi-automatic for company. Sure, the desire to play at soldiers is childish, but so is the desire to play computer games. Which logically makes *Spec Ops*, a game that brings the two obsessions together – just the thing to pander to the kid in all of us.

The idea behind *Spec Ops* is straightforward enough. The PC is great at handling simulations, so why not simulate the role played by real soldiers rather than a plane, tank or some other hunk of

metal? It's just the sort of crazy idea that holds the potential for doing something new, be it combining the first-and-third person combat of *Quake* and *Jedi Knight*-style games with a contemporary war theme, or doing something unique with familiar wargame ideas by giving players direct control in a 3D world.

What is just a little surprising is how much *Spec Ops* leans towards the former. During development, there was every indication that this would be the game to depict every last detail about the role of the *Spec Ops* ranger – from the handling of firearms to the sensations experienced in the heat of the battle. Much talk of input from real rangers and a game engine designed to maximise that outdoor experience led many to expect a genuinely new sort of military game. Instead, it often feels like a familiar genre, albeit one wearing a new pair of combat trousers.

## Feeling like you're there

And yet, while never really fulfilling its potential, *Spec Ops* is remarkably good at what it does. Visually, at least, developer Zombie has got things exactly right – if you've got a 3D card, that is. With judicious use of fogging and toned-down colour palettes, the environments deliver atmosphere by the lorry-load. Night missions make night-vision goggles all but essential. You'll also find that jungle levels are wonderfully murky. Even the sparse-looking snow levels do a convincing job.

There are few clever visual tricks used here, and the polygon count isn't so high as to astound, yet the battlezones are massively impressive creations. In a market awash with pristine but unconvincing 3D card-generated game worlds, this game's ability to turn a few textured triangles into an immersive warzone really is quite remarkable. And top marks to Zombie for its work on the audio, with spot effects and voice samples aiding the real-world feel.

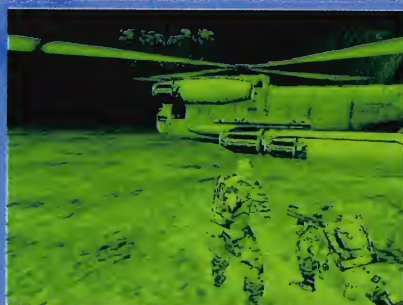
And so into these cunningly rendered environments the *Spec Ops* rangers go. You control them one at a time, with the ability to switch control to back-up soldiers at any time. The levels play out

## Downed and out

When a spy plane crashes in the forests of Russia, it can only mean one thing – this is a job for (cue tense music) – the *Spec Ops* rangers. Weapons at the ready...



above: Having wiped out the enemy's communication system, our intrepid duo make their way to the crash site, in an attempt to recover the plane's data module.



above: With the module recovered, and a pair of anti-aircraft guns freshly destroyed, our rangers are able to call in the helicopter for extraction.



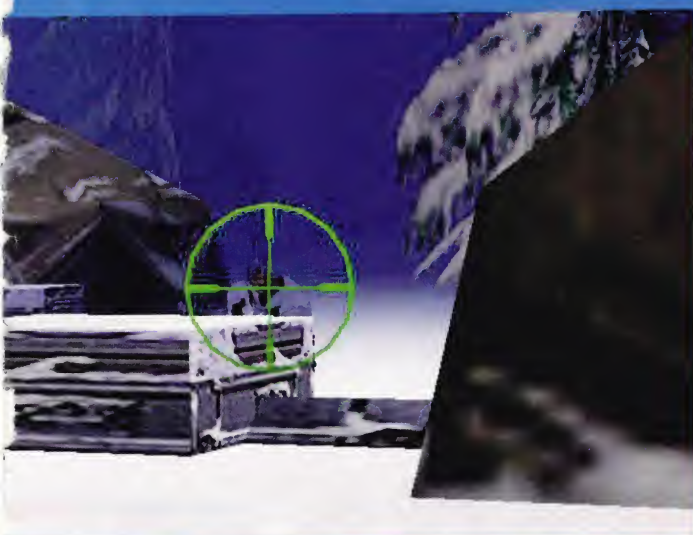


above: As you can see, with a 3Dfx card, the environments look lovely even when there's not really that much to see.



above: The jungle missions show the 3D engine off best, the smart use of muted colours really coming into its own.

below: Why risk getting too close when you can switch to a four-times zoomed sniper's viewpoint?



## This sense that real military strategies are usable is what makes Spec Ops so intriguing... things never degenerate into simple shoot-'em-up set pieces

modern 'what-if' scenarios, with each of the five missions – one in the Russian Voronye forests, another in the snow-covered mountains of North Korea, and so on – split further into phases, usually three or four. Missions vary from simple directives 'to get in there and kick arse'-type commands, plus to the recovery of technology and the destruction of MiG planes. Naturally, there's a bias towards blasting, but each section manages to offer something different, with carefully placed enemies further demanding fresh approaches from the player. So, while in one area it may be wise to hit the ground then shuffle over the brow of a hill to get a good vantage point for sniping, another location may benefit from a couple of smoke bombs and a grenade or two to shake up the bad guys.

### Lock, load, aim...

This sense that real military strategies are usable is what makes *Spec Ops* so intriguing, the claustrophobic level designs ensuring things never degenerate into simple shoot-'em-up set pieces. That said, there are many other elements that are so obviously aimed at the action crowd – like the way the enemy die so much more easily, for instance. It would have been far more authentic to make them more poorly trained, but instead the odds are evened out by the oldest arcade game trick in the book.

Why go to all the trouble of offering a sniper's viewpoint when there's not even the ability to fine-tune grenade lobbs? There's plenty of opportunity for running, crouching, and ground-hugging, yet it's

painfully obvious that a real *Spec Ops* ranger would be capable of so much more. Surely they can roll down a hill without sustaining damage, run at more than 5mph, and take less than half a day to switch from a standing to crouching position? The game is as much a battle against the limited control system as it is one with guns.

Still, it manages to be great fun to play. Even with the restrictions imposed by the game's *Quake/Jedi Knight*-influenced approach to the user interface, there's something magical about heading off into the ice storms, rain-drenched jungles, and battle-scarred landscapes of *Spec Ops*. So why no fanfare, flag-waving, or overdoses of superlatives?

The answer lies in the multi-player mode. Put simply, there isn't one. With certain types of game, this is understandable – but here it's sheer madness. This is a design just crying out for co-operative and competitive modem, network and Internet play. All the standard levels are designed for more than one ranger, so why restrict the fun? And just picture how intense firefights between whole teams of rangers could be. Even the *Quake* games would start to worry...

Instead, *Spec Ops* is happy to remain in its own isolated world, oblivious to multi-player warfare. While it's still a fine game for solo play, it does compound the feeling that more could have been made of the idea at the heart of the game. *Spec Ops* really is very good. A little extra work, and it would have been great. **PCR**

Developer: Zombie  
Publisher: Take 2 Interactive

Contact: 01753 854 444  
Price: £39.99

Recommended system: P200, 16MB RAM, double-speed CD-ROM drive, Windows 95, 3D card

For: Lovely environments, top level design, very atmospheric

Against: Controls, no multi-player, more arcade than sim elements

**seven** out of **ten**

above: The night gloom is temporarily banished as a frag grenade hits its target.

### LONG RANGE

The US Army Rangers have their roots way back in the 17th Century, where frontiersmen adopted tactics used by the Native Americans. Following the success of the first organised unit in 1670, the rangers went on to fight for the British in the French and Indian Wars, then against them in the Revolutionary War. Since then, they've fought for the States right through the 20th Century: in World Wars, Korea, Vietnam, and so on – right up to a Somali conflict in 1993 (carrying out operations in support of the United Nations), where they lost 6 men but killed 300.



below: The player models are a tad basic when viewed this close, but the motion capture-based animation ensures they move superbly.



above: This action replay shows just how versatile the 3D is, with real-time lighting effects used on the pitch.



above: *World League Soccer 98* in action. Not the best looking sim, but one of the more playable.



right: It's possible to customise the distance, height and angle of the camera. This sort of view yields the best results.

# WORLD LEAGUE SOCCER 98

Eidos' latest takes to the pitch without official branding, but plays a tight game. **BY MARK RAMSHAW**

## ON THE DISC!

Load the demo from CD Review and kick a small virtual ball across your desktop.



With one poorly received stab at football already in the bag for Silicon Dreams, and an absence of any sponsor tie-in (World Cup-based or otherwise) on this latest attempt at the sport, you'd be forgiven for expecting very little from *World League Soccer 98*. Forgiven, but quite wrong...

For while it may not benefit from a marketing spend to rival the GNP of a Himalayan country, *World League Soccer 98* demonstrates skill, style and confidence on the pitch. Which is where it counts, after all. Indeed, while a little less lavish than the likes of *World Cup 98* when it comes to graphical polish and front-end presentation, the two aren't so different in their approach. Granted this has far worse commentary, but then the crowd effects – arguably a more crucial aspect of the audio – are spot-on.

As you'd expect, motion-captured animation – courtesy of Les Ferdinand – is the key to graphical fluidity. The results are wonderfully slick, with every slide, turn and smallest piece of ball control making the sport seem far more graceful than it could ever be. The player models aren't as subtly built as those of *World Cup 98*, but then that game doesn't have *World League Soccer's* wonderful shadow effects. It's worth mentioning that slower machines suffer particularly badly when it comes to frame rates, though, and all that lovely animation does seem to affect responsiveness. Certainly *Actua Soccer 2* has the edge over this title when it comes to unadulterated arcade thrills.

But with enough processor power to keep things moving along, the matches both look and play superbly. Computer AI is good, and the range of moves (a six button pad is nigh on essential) leaves plenty of room for strategy without swamping the player with secret

combinations. Headers, overhead and scissor kicks are all context-sensitive, while extra or longer button presses also affect moves. It's even possible to control the amount of slide put into a tackle.

If there's a weak area in *World League Soccer*, it's in the front-end, where the lack of proper World Cup or similar licence robs things of that crucial sense of occasion. While *World Cup 98* spills over with rock music, FMV, and event-related logos, the menus here are flat and rushed looking. In truth, this sort of thing doesn't really improve the game one iota. Yet today's sports fans are used to MTV-quality presentation, and it's arguable that such gubbins serve to psyche gamers up before taking the battle onto the turf.

It's this low-on-the-frills-but-high-on-the-thrills that characterises Silicon Dreams' contribution to the world of PC football. It's a shame that the World Cup is raging all around, and that Electronic Arts' has set crazily high standards with its official title. This is because *World League Soccer 98* really is a class act. If you're football-mad enough to want two star players in your team, then give this plucky young Brit contender a trial right now. **PCR**

Developer: Silicon Dreams  
Publisher: Eidos

Contact: 0181 636 3000  
Price: £39.99

Recommended system: P200, 16MB RAM, double-speed CD-ROM drive, Windows 95, 3D card

**For:** Highly controllable, solid gameplay under accelerated visuals

**Against:** Not quite dynamic on the pitch or off as EA's mighty effort

**eight out of ten**



# WORLD CUP 98



The FIFA series bags another big licence and heads for France. BY MARK RAMSHAW

First things first. The World Cup emblem may loom large on the box, with the FIFA logo tucked away to the side. But make no mistake, this is definitely a game belonging to EA's FIFA series. The question is, how much does it differ from FIFA 98?

Okay, so the lack of new graphical or gameplay innovations means that, unless you're a real footy fanatic, there's no point in owning both games. On the other hand, if you haven't already tasted the delights of the modern FIFA 98, then World Cup 98 provides the new, improved alternative. Just think – it's the officially licensed game of both FIFA and the World Cup competition, and still has plenty of gameplay to boot. It's not like the old days of World Cup computer game crapola, that's for sure.

First the new stuff – the best of which is the ability to play through the whole event using the final team selections, wearing the correct strips, and players performing as well as the up-to-the-minute data suggests they will. It's now possible to activate handicapping to override this, ensuring that you don't get an unfair advantage simply by choosing a good team. And just in case that doesn't level the playing field enough, a catch-up option is also included, giving losing teams a strategic boost to improve their chances of equalising.

Management elements have also been upgraded, with new formations and in-game strategies to select, as well as special tactics like offside trapping, and wing-back runs to further improve the chances of those who take the time to look beyond the kick-around aspects of the game. Even the more casual gamers will notice a few tweaks, such as the ability to speed up the action to *Actua Soccer 2* levels, improved goalkeeping, and the addition of some new special moves and dummies.

So far, so subtle. More noticeable is the addition of the god-like Chris Waddle and Gary Lineker in the commentary box, plus the

ability – if you manage to win the Cup – to go back in time and replay eight classic matches from the last century. These are depicted with all the correct trappings, right down to baggier shorts, a different kind of ball, and black and white visuals for the older games. Even veteran commentator Kenneth Wolstenholme has been drafted in to provide the voiceover for these matches. It's enough to bring a tear to the eye of dedicated supporters.

Finally, a whole new front-end provides an extra reminder of the World Cup licence, with new FMV sequences and even new commercial music tracks linking the on-pitch action, all well up to Electronic Arts' usual peerless standards.

World Cup 98 feels uncannily similar to FIFA98. For the first few in-game minutes, you really will be hard-pushed to tell them apart. But then, the still-crap weather effects and controversy over updating a game less than nine months old aside, it's really hard to grumble. In an ideal world this would be a true sequel to EA Canada's last effort. But can you really find a reason to grumble when the world's best 3D footy game just got better? All we need now is for our boys to perform as well on the actual pitch... **PCR**

Developer: EA Canada

Contact: 01753 549 442

Publisher: Electronic Arts

Price: £39.99

Recommended system: P133, 16MB RAM, double-speed CD-ROM drive, Windows 95, 3D accelerator

For: The best 3D soccer game, with added Cup licence extras

Against: Not much in the way of real gameplay improvements

**nine out of ten**

## THE TIME AND THE PLACE

Want to impress your mates with your World Cup knowledge? Just reel off these dates and locations of previous Cup venues for extra brownie points.

1930	Uruguay
1934	Italy
1938	France
1950	Brazil
1954	Switzerland
1958	Sweden
1962	Chile
1966	England
1970	Mexico
1974	Germany
1978	Argentina
1982	Spain
1986	Mexico
1990	Italy
1994	USA



left: England celebrates scoring two goals against France. It's only a game, obviously.

below: This time around Lineker, Waddle and Kenneth Wolstenholme join Des and Motty in the commentary box.



## New and improved

The best just got better – World Cup 98 improves on some of FIFA 98's shortcomings...



above: World Cup 98 enables players to alter the strictness of the ref. Here one does his best to sell a spare ticket for the final.



above: And now it's possible to relive those classic footballing moments, like the 1966 Cup Final. Oops, the Germans are winning.



above: As you can see, the players in World Cup 98 don't benefit from Uri Geller's levitation techniques.

left: It's worth scoring just to see what daftness the players will get up to. Cartwheels, aeroplane impressions, and, er, orgies are all included.



below: Classic teams as well as current are all included in *Three Lions*.

right: Here's our boys lining up, with very small waists indeed...



left: Bergkamp skins Sammer. The German was our undoing in Euro 96 – how about France 98?



above: Maybe Sol didn't hear his team mates cries of "Behind You!" Still...



above: Let's all sing together: "Three Lions on the shirt, Paul Ince is still gleaming." Good luck in France lads!

# THREE LIONS

You've sung the tune, and now you can play the game. BY MARK RAMSHAW

## MADE IN BRITAIN

An odd and possibly telling fact about the *Three Lions* game is that it isn't even British. It was actually coded by Z-Axis, a bunch of Californians, along with ex-*Kick Off* man Dino Dini. The next project from Z-Axis is a title for MGM Interactive based on the classic movie *Rollerball*. Fingers crossed for an altogether classier sports sim.

First the good news: that bloody annoying tune by The Lightning Seeds, Skinner and co isn't included. Unfortunately, Ocean Colour Scene have managed to infiltrate *Three Lions*, the game endorsed by the FA. But then, you can't have everything – something that the way *Three Lions* plays shows only too well. The attempt to create a more believable, immediate kind of football simulation is commendable. But the results are neither more convincing nor more playable than in any of the competition.

The strange thing is, there's apparently an awful lot of work gone into sorting motion capture data, generating different abilities for every single player (no mean feat when you consider that classic teams are included as well as all the familiar current international sides), and generally ensuring that *Three Lions* is much more than an arcade-style kickaround. So quite why the finished game plays exactly like an arcade-style kickaround is something of a mystery.

The developer claims this is how computer football should really be: So, after-touch and fancy button combos don't get a look in. But the claims about accurate player and ball modelling don't correlate with what's going on up there on-screen. The one-touch passing is challenging but superb, making it possible to create some breathtaking sequences. But when it comes to actual dribbling, physics goes right out the window, as do player animations and a whole bunch of vital elements.

The other problem here is that, although it's possible to change tactics right in the middle of the game, matches are far less strategic than they ought to be because the AI fails to convince. Again, there are claims from the developer that each team and player should act just like their real-life counterpart, but in reality every match in *Three Lions* is just too messy. Players tend to steam after the ball rather than get into sensible positions, with the result that there's usually a confusing mob gathered around the poor chunk of leather. If the game handled tackling with an element of finesse, this

wouldn't be a problem – but there's just no sense of accuracy to stealing or losing the ball. It makes all the clever ideas about being able to target which player to pass to just a little redundant, as there's rarely the space on the field or even the free time to think a good idea through.

Even the audio side of things feels like one step forward and two steps back. On paper, dropping tedious commentary in favour of a system where players call to each other is great.

In practice it fails to help the player, and adds less atmosphere than the flawed idea it replaced. And the graphics, while admirably speedy on low-spec PCs, are very, very wrong. It's all very well scanning in every player's face, but when they lack detail, look flat, and find themselves attached to mis-shapen, averagely animated bodies, the effect that's created is more like caricature than photo-realism.

There are certainly some good ideas here: the targeted pass and shoot system is promising, the lack of commentary is brave, the use of moving cameras is faultless, and the ability to change tactics mid-game warrants further exploration. But these moments of inspiration are never given a chance to shine in such a flawed creation. It doesn't play much like real football, doesn't move like real football, and isn't much to look at, either. More toothless pussycat than three lions, all told. **PCR**



Developer: Z-Axis Contact: 0181 636 3000  
Publisher: Take Two Interactive Price: £39.99

Recommended system: P133, 16MB RAM, double-speed CD-ROM drive, Windows 95

For: Zippy on low-end PCs, good cam views, speedy passing

Against: Dodgy visuals and AI, little real ball control

six out of ten



# ULTIMATE SOCCER MANAGER 98

Are your skills **Gross** or does the sun shine out of your **Arsene Wenger**? **BY GRAHAM SOUTHORN**

The times they are most certainly changing. Where once there were old school coaches striding the touchline in cloth caps and sheepskin coats, the new breed of continental manager has introduced sharp suits, mobile phones and foreign accents to the dugout. Just as Arsene Wenger and Christian Gross have brought a fresh approach to the British game, so *Ultimate Soccer Manager 98* boldly claims to possess a radical new style of play.

It certainly has a lot to prove. In the two years since the last *USM*, we've reviewed such promising apprentices as *Premier Manager* and *Fifa Soccer Manager*. The competition is fierce.

You can take the reins of any professional club from a pick of half a dozen different countries (England, Scotland, Italy, France, Spain and Germany). And of course, there are accurate stats on real-life players, freshly culled from last season. You play the game by exploring the locations in a virtual stadium. This involves picking up the telephone to take a call in your office or clicking the blackboard in the dressing room to change a team formation. It's so much more inviting than reading screens full of numbers. You can almost smell the rancid cigar smoke in the Chairman's office.

Once you've selected the team and configured the tactics, it's up to the boys to do the business on the field. Or not, as is too often the case. You see the games from a side-on view, which scrolls left and right with the action to display about half of the pitch at any one time. This is unquestionably a good thing because you can see if your tactics are working. You can choose a range of special moves, such as the near-post flick at corners, that your obedient players will attempt to execute during the game. Opt to play a passing game and you'll

see more careful build-ups rather than the predictable Route One. How much training you demand from your players, and what type, is up to you. Planning a session involves picking skills like heading, defending and fitness and allocating them a suitable slot in the weekly timetable. Individual players can also be given instruction on a particular skill, provided you've hired a badge-holding coach with the necessary know-how.

Coaching is only one aspect of the game. Recruiting players is equally crucial to a successful team. To buy a player in *USM 98* you first have to contact him through his agent, before becoming involved in several stages of contract negotiations with the club and the player himself. You even get the chance to slip the odd bung.

At the end of the day, it's the little touches that make *USM 98* so much fun. After a poor home defeat on the first day, the local press ask you to sum up your feelings. In these situations it's best to choose the diplomatic response. "I want to continue the great things that have been achieved here and the go even further." Quite! **PCR**



## MONEY TALKS

Like any management sim worth its salt you can also get stuck into the financial side. The easier the skill level you select to begin with, the more money you have at your disposal. The whole thing is incredibly detailed, right down to setting prices for individual items of food and merchandise on sale at the ground. There are also adverts in your club's match magazine and on billboards around the pitch perimeter. And of course, there are stadium improvements too, so you can pack in more punters to increase revenues.

Developer: Impressions UK  
Publisher: Cendant

Contact: 0118 920 9100  
Price: £34.99

Recommended system: Pentium 75, 16MB RAM, 65MB hard disk space, four-speed CD-drive, Windows 95

For: Very realistic transfer negotiations

Against: Players run in straight lines on the field

eight out of ten



left: *West Bromwich Albion put Bradford City under pressure in a crucial away tie at the Pulse Stadium.*

right: *The stadium and the buildings around it take you to the different menu screens.*



above: *The team talk menu is used to decide on overall tactics. Including decisions, such as who takes corners and free kicks.*



left: *The squad room is just one example of *USM 98*'s lovely screens.*

left: **USM 98*'s training mode is incredibly detailed, with hourly slots devoted to different disciplines.*



above: *Get a good match report in the press and you can cut them out and preserve them for posterity in a rather snazzy virtual scrapbook.*

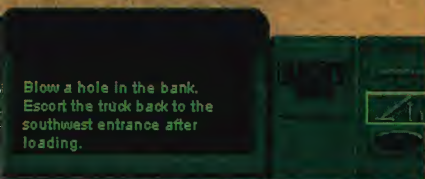
left: *From the team selection screen you can view the players' ratings for skills such as shooting and stamina.*





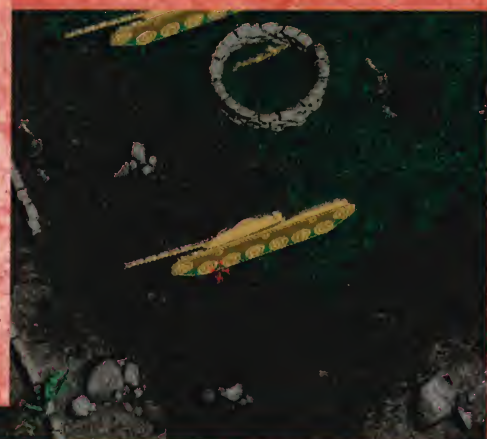
above: A foolish Tan soldier causes a 'friendly fire' incident. A court martial will follow in due course.

below: It's best advised you play the Boot Camp level to become familiar with the gameworld.



above: Remember (and we quote): "you're only supposed to blow the bloody doors off."

right: Tanks can be used to crush your enemies to death.



# ARMY MEN



They're **small, green and plastic**, but they're not to be toyed with. **BY TIM CANT**

**LIFE IN PLASTIC...** is fantastic, apparently. To celebrate, *Army Men* comes packaged with some genuinely real toy soldiers to play with. However, you may well get so frustrated with the game you decide to take it out on these moulded innocents. Here are PC Review's top five ways to kill them (in reverse order):

5. Let the cat eat them.
4. Put them in the waste disposal.
3. Put them in the food processor
2. Put them in the microwave.
1. Burn them with a magnifying glass.

Have fun y'all!

*Army Men* opens rather superbly with a Pathé News pastiche that sets the scene for the action to follow. It's well observed and funny, which is great considering the chronic lack of imagination that goes into most FMV sections these days. Sadly, however, when you get into the game proper, it's puzzlingly traditional. What is the point of making your game about little plastic soldiers if they're going to fight in the bog-standard scenarios as games of real soldiers? Surely the whole point about basing the game around the antics of tiny toys is that it can be set in their natural environments such as sandpits and kitchens rather than deserts and forests? With a slight alteration of a few graphics and *Army Men* could have easily been about real soldiers, which is a huge waste of a great idea.

The action centres around your character, the Sarge. You control him directly, and he can run, dive for cover, roll about to avoid enemy ordnance, shoot, and utilise a whole bevy of explosive weaponry. In some missions you can take indirect control of other soldiers via the Sarge, and they can be ordered to follow him, attack enemy units and guard strategic positions. If you find a vehicle then you can hop inside and use it to traverse the game world more quickly – and more safely, especially if it's a fearsome tank. Of course, the enemy have plenty of infantry and vehicles of their own with which to make your life a) a misery and b) short.

The missions themselves are quite varied, and encompass such daring deeds as assassinating an enemy courier (pretty tough) and robbing an enemy bank (mind-searingly tough). *Army Soldiers* is a hard game, and even the first scenario (of three) features missions that would make cult video-game champion Danny Curry throw

down his mouse in frustration. What's more *Army Men* contains glitches that could conceivably drive an innocent journalist to drink. When you're changing between your weapons there's a fair chance one of them will for some reason activate itself, possibly blowing you sky high. When Sarge gets hit by an enemy bullet he is stunned for a short period of time, so if you decide to take on three or more enemy soldiers (and often you won't have a choice) then chances are they just keep pummeling you and you'll lose most of your precious health. Often the only way to work out what to do is to play the mission through several times so you know exactly what to expect, then keep trying until by either luck or extreme skill you manage to survive. If you're not incredibly careful your vehicle could get permanently caught on a piece of scenery, which is just ridiculous for a late 90s game.

There's simply not enough space here to list everything that's wrong with *Army Men*. Try it if you must, but it's likely most will be disappointed with this lacklustre release. **PCR**

Developer: 3DO  
Publisher: Ubisoft

Contact: [www.armymen.com](http://www.armymen.com)  
Price: £34.99

Recommended system: P90, 24Mb RAM, CD-ROM drive, Win 95  
Supports: Direct Input devices and Internet play.

**For:** Packaged with some hugely entertaining toy soldiers

**Against:** A terrible waste of an excellent idea

**five out of ten**



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[www.win98.co.uk](http://www.win98.co.uk)



right: A typically explosive scene from Simis' long-delayed *Team Apache*.



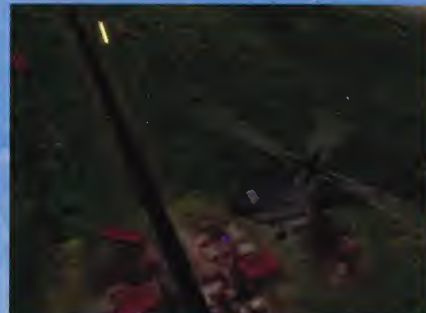
above: Knocking out a tank with a hydra missile, as viewed in Direct X mode.

below: The 3D cockpit mode, with IHADS overlay providing essential targeting and navigation info.



right: After training in Utah, the action switches to Colombia, where drug barons are the bad guys.

far right: And then it's on to Latvia, where the enemy is better equipped, and snow is more likely.



# TEAM APACHE

## STATE OF INDEPENDENCE

Simis has produced a whole string of flight simulations, with many published by Domark, the publisher that formed the basis of the Eidos empire, and owned a controlling stake in the developer. But while Eidos was scheduled to publish *Team Apache*, it sold the Simis name back to the original owners in March (a result of the long development delays, perhaps?), simultaneously removing the game from its release schedules. This left Mindscape in a position to grab the publishing rights, and Simis able to continue developing titles for other parties, including Grolier who'll be releasing *Xenocracy* next month.

Lookout Longbow, Simis' sociable helicopter sim is here. **BY MARK RAMSHAW**

Simis was once regarded as a die-hard flight simulation developer, but with the not-terribly good *Terracide* and the complete absence of any other finished titles over the last few years, it'd be easy to assume this was its first game with an aircraft fixation. *Team Apache* is the result of many years working on PC flight games, not to mention several years worth of work on this game alone. This was originally due out at the beginning of 1997, after all.

Quite what caused the delay isn't immediately obvious, though certainly the dynamically-linked campaign missions must've taken some fine-tuning, and the attention given to the instant action and customisable one-off missions along with the lengthy tutorial is also obvious. The latter is a little too long, but does contribute in part to *Team Apache's* wonderful accessibility. Given that it's attempting to deliver a serious simulation (with a side order of 3D accelerated pulse-quickenning action), it's quite a shock to find such a gentle learning curve.

The *Apache* itself represents familiar territory to the seasoned flight fan, with Digital Integration's *Apache* and *Jane's Longbow 1* and 2 already demonstrating just what a fearsome and hi-tech helicopter this is. There is something very lovely about a self-aiming gun mount, not to mention all the other weapons targeting hardware on-board.

Obviously it's hard to gauge which game has the more accurate flight model, but the subtleties present here certainly feel authentic, the *Apache* bucking around the skies surprisingly easily. Novices will be eternally thankful for the auto-pilot and auto-hover toggles. But then this is really how it should be, the task of learning how to control the vehicle providing just as much of a challenge as the missions themselves.

Visually the long development period has taken its toll, with Direct X mode now appearing a touch dated. The 3Dfx version is a

lot more detailed (with good lighting, fogging, and weather effects), but even this lacks the punch of *Longbow 2's* light-sourced 3D engine. But then that game proved sluggish on anything but a top-end PC, whereas *Team Apache* manages to deliver its graphical goods whilst still retaining that all-important responsiveness.

With both games offering broadly similar options, from the tutorial to the multi-player modes, it's down to the campaign systems to really set them apart. For while both employ a dynamic system that has player performance affecting other events on the battlefield, Simis' title also brings an optional crew management aspect. With this active, you need to mind limited resources, organise repairs and re-stocking on your fleet of *Apaches*, and even give the team pep talks. Having to make do with finite levels of equipment is definitely a good idea, though whether sim fans will really relish the idea of dealing with crew morale is unlikely.

Had this arrived when scheduled, there'd be no question about recommending it as the best helicopter-based flight sim around. But with *Jane's Longbow 2* already out there, and Empire's hugely promising *Apache Havoc* readying for take-off, things are no longer so clear cut. *Team Apache* has the necessary muscle and the depth, but doesn't manage to outgun the competition in ever area. **PCR**

Developer: Simis Contact: 01444 246333  
Publisher: Mindscape Price: £39.99

Recommended system: P166, 16Mb RAM, double-speed CD-ROM drive, Windows 95, 3D accelerator

**For: Highly accessible, plenty of game options, fluid 3D**

**Against: Not as slick as the *Jane's* game**

**eight out of ten**



# COMANCHE GOLD

It flies better, but is **Novalogic's update** really as good as gold? **BY MARK RAMSHAW**

**T**he *Comanche* games have always been a strange breed, what with that bumpy voxel-based terrain, arcade-based mission designs, and unashamedly unrealistic flight models. Indeed the first in the series might as well have been simulating a battle between flying saucers, such was the lack of authenticity in pretty much every area.

While never one for the true sim buff, Joe Public has always been fond of the *Comanche* family, not least because they don't require a degree in astrophysics to control or go overboard on that wonderfully bumpy terrain, and cram in an extraordinary amount of action into those missions. So it is with this, an extension of, rather than a sequel to, the extremely popular *Comanche 3*.

A mission editor and those new campaigns, the fifth and final of which has been designed by a former *Comanche* officer, form the core of this *Gold* edition. Really though, all this could easily have been offered as an add-on pack. Instead it's the game engine tweaks and the multi-player facilities that provide the real draw. Weather effects are included this time around, and the whole shebang is now Windows 95 native. Sadly, while MMX-based chips are supported, the voxel-based nature of the graphics engine means 3D cards don't get a look in. Not such a problem except the game does run surprisingly slowly, at least as slow as polygon-based flight sims, in fact. And even with the highest detail setting scenes tend to have that Legoland look. Still, the raggedness of the landscapes aside, the environments are wonderfully undulating, making low level tactics far more practical than in most helicopter sims.

The *Gold* edition also boasts a touch more in the way of realism, with better wingman intelligence, and an advanced flight model option. In truth even this mode feels like child's play after taking any other helicopter simulation out for a spin. Unless real *Comanches* are blessed with near-flawless stability and manoeuvring capabilities, it's fair to say this game is more about flight than

simulation. But then *Comanche Gold* obviously doesn't really want to go down that route, instead keeping key presses to a minimum (it's not even necessary to switch the engine on) so as to let the player focus on the more immediately gratifying task of blowing the stuffing out of enemy units. Which is, if again not the most authentic experience, at least a hell of a lot of fun.

This time round it's far easier to have those enemy units controlled by other humans, with support for the new Novaworld Internet system built in. More than those new missions and engine tweaks, it's the promise of easy peasy Net play that's makes *Comanche Gold* a worthwhile investment.

Make no mistake, this is in no way an authentic look at the role of the *Comanche*. Those itching to find out what helicopter flight is like would be better off attaching a ceiling fan to their heads than diving into *Comanche Gold*. And as effective as those voxels are at replicating the craggy look of rocky terrain, it's a system that's looking increasingly dated. But it does offer the fastest route to the skies, the most finger-trigger intensive flying once you've got there, and – thanks to Novaworld – the most accessible way to start your own little war. If you like a bit of simulation with your relentless arcade action then *Comanche Gold* is the one for you. **PCR**

Developer: Novalogic

Publisher: Novalogic

Contact: 0171 4051777

Price: £39.99

Recommended system: P200, 16Mb RAM, double-speed CD-ROM drive, Win 95

**For:** A breeze to play and with better missions

**Against:** Still more of an arcade game than a sim

**seven out of ten**

## ON THE DISC!

Check out the rotor system with a demo of *Comanche Gold* on the CD Review disc.



## THE BIG BANG

*Comanche Gold* is the second title to make use of the free Novaworld Internet match-up system, Novalogic having already launched it with *F-22 Raptor*. Playing over the Net with Novaworld it's possible to take advantage of the multiplayer options, with 72 single player missions available, plus eight head-to-head missions. Hopefully it'll be possible to battle against *F-22 Raptor* players, not to mention tank-based opponents using *Armored Fist 2*.

below: The graphics engine does make it possible to portray some wonderfully organic-looking environments.



above: Of course some of the missions do take the artistic freedom a little too far.

below: The cockpit view comes complete with MFD monitors, but precious little else in the way of instrumentation. This is because *Comanche Gold* prefers to focus on combat.



above: Although the helicopter is built using regular polygons, the ground units are, like the ground itself, constructed with voxels.

right: *Comanche Gold* boasts new missions, more realistic flight modelling and even Internet play.







left: *That tilting action in full – don't forget your knee pads, though, or there'll be tears...*



above: *This is your handy (and scary) rear view. But remember kids, keep your eyes on the road.*

left: *Time to rev up and get your adrenaline pumping. Red light, green light, go go go!*



above: *Nice to see faithful Post Office reproduction in computer games*

below: *Those curbs can be tricky fellas, especially at high speeds.*



above: *Under the bridge – just like the All Saints, it's the place we love...*

# CASTROL HONDA SUPERBIKE WORLD CHAMPIONSHIP

## ON THE DISC!

Put your hand on the throttle and your knees on the tarmac, with the demo on the disc.



## MOTORCYCLE EMPTINESS

Sadly *Castrol Honda* doesn't have a rocking soundtrack. This means unless you're prepared to put up with just the engine roar, you'll have to provide a soundtrack yourself. *PC Review* suggests 'Leader of the Pack' by The Shangri-Las, a record which not only features a catchy chorus, but genuine motorcycle sounds too.

Strap on your leathers – it's the PC's first proper motorcycle sim. **BY TIM CANT**

**D**espite the huge number of racing games released over recent months, bike-loving PC owners have had a fairly raw deal. Apart from Delphine's excellent *Moto Racer*, there's been nothing to really get your teeth into for years. Thankfully, it appears progress is being made – what with last month's *Red Line Racing* and now *Castrol Honda*, there's finally some choice on the cycle sim front.

This game is more of a proper simulation than *Red Line* or *Moto Racer*, and the manual purports that *Castrol Honda* is "the most accurate motorcycle simulation ever made". Of course, with the competition being so arcadey, that claim isn't as audacious as you might first imagine, and it's probably not wrong.

The tracks your virtual biker rides around are based on real life courses, too. There are no spectacular fictional sea-side or mountain tracks with low-flying helicopters here. Also, rather than observing the action from the now familiar behind-the-bike position, a first-person perspective is the order of the day, complete with tilting aplenty. This means the game has a substantially different feel to either of its rivals, and is clearly aimed more at the hardcore motorcycle fiend than the arcade hungry speed-freak. For example, you can indulge any gear-ratio fiddling fantasies you may have, or experiment with different tyres until your hands are sore.

If you're a less experienced gamer, this has something for you too. Simply select one of the game's easier difficulty settings, and you can enjoy a simpler race where you can throw your bike around willy-nilly without writing it off. It's still a fairly tricky ride and complacency is rewarded only with the foul stench of defeat.

Patience and practice are both required, plus you'll have to get

used to the unforgiving controls. Playing with the keyboard is a no-no, and, unforgivably, there's no way to alter the mouse's sensitivity setting. To make things worse there's no 'restart race' option either, and loading takes an absolute age. Unless you're pretty Zen, chances are you'll soon be taking a drive up frustration avenue.

The game engine itself isn't exactly a thing of beauty, either. It doesn't have the feeling of smoothness we've come to expect from a modern racer, and the graphics are quite plain even with a 3D card. Having said that, there is a clear variation in quality between courses. The Mr T-endorsed Sukuh Island track is dreadful – it has horrible graphics and is a wrench to play, whereas Cangua Town is pretty and more fun all round.

*Castrol Honda Superbike World Championship* has the motorcycle sim market all to itself right now – so if you've just got to have one, then this is the one to choose. But if you don't mind two wheels or four, there are better driving games out there. **PCR**

Developer: Interactive Entertainment  
Publisher: Interactive Ents

Contact: [www.interactive-entertainment.co.uk](http://www.interactive-entertainment.co.uk)  
Price: £34.99

Recommended system: P133, 16MB RAM, CD-ROM drive, Win 95, 3D card Supports: Joysticks, wheels, network play

**For:** The only proper motorcycle simulation on the PC

**Against:** Feels a tad ropey, and may well be surpassed soon

**six out of ten**



# MONSTER TRUCK MADNESS 2

The **big buggies** are back, and they look better than ever. **BY MARK RAMSHAW**

The cult of the monster truck, which involves whacking regular station wagons and trucks onto tyres the size of buildings, is very much an American one. Although as a spectator sport it's never really caught on over here, chances are most people would just love to get way up there in the driver's seat of one of those beasts. Which makes the relative failure of the first *Monster Truck Madness* game a little surprising – if there's any justice, this first-class follow-up will have more success on this side of the pond.

The secret of this wheel-squealing sequel's success lies as much in what hasn't changed as what has. Developer Terminal Reality has, thank goodness, retained that simulation-like approach to vehicle handling, tweaking rather than re-jigging the use of four-wheel suspension physics. Instead, more effort has been placed on widening the playing options, and adjusting the visuals to keep abreast of current technology. But while this doesn't sound like much, in a sport as visceral as this the graphical side of things is crucial. The addition of new tracks, vehicles and multi-play options – including free on-line play via Microsoft's increasingly excellent Internet Gaming Network – can only be a good thing.

Sadly, it's an all-too-familiar story for those without 3D accelerators. At the risk of entering broken record territory, this is yet another game that fails to make the grade in terms of looks or speed unless running on something better than a P200. And if you've got one of those, you really should be using a 3D card too. If you're not, this provides yet another convincing argument why you should. Because with one of these under the bonnet, *Monster Truck Madness 2* is transformed from something suspiciously similar to its predecessor into a whole new experience.

First to benefit from the extra welly are the monster trucks themselves. They always had the moves, but now every wheel bounce, turn and slide is perfectly conveyed. And with some marvellous light mapping the bodywork makes them just about the best looking computer cars around – all shiny curves, perfectly

smooth wheels and glinting glass. Hell, they even leave solid tracks in dirt, just to further highlight the fact that this is a game where the vehicles really do fully interact with the world around them.

Although not quite so visually lavish, the tracks are definitely more convincing this time around, and feature much more in the way of breakable scenery and OTT jumps – all the sort of stuff that turns races into something more than a case of who gets the fastest lap. In fact, even the idea of laps is a little arbitrary here – if you can find an off-road alternative way to reach the checkpoints you're quite welcome to go for it. Ultimately, there's a certain samey-ness to a few of the featured courses, but the addition of several weather conditions and night driving modes (games of tag in the pitch dark are already popular on the Internet Gaming Zone) ensures longevity for the game.

If there is a problem here, it's that racing monster trucks is rarely a tense experience. These giants of the racetrack just don't go very fast, so games are more madcap than nailbiting. But then, it's not a bad price to pay for just about the most immersive courses and best car physics around. And when it comes to competing against other players, which would you rather be driving – a formula one car or a big, daft, brick on wheels? Chances are it's the latter. Maybe the Americans are on to something with this after all. **PCR**

Developer: Terminal Reality

Contact: 01753 854444

Publisher: Microsoft

Price: £39.99

Recommended system: P166, 16MB RAM, double-speed CD-ROM drive, Windows 95, 3D card

**For:** The vehicles look great and move flawlessly

**Against:** Some tracks are formulaic, never any sense of real speed

**eight out of ten**

## ON THE DISC!

Load the CD Review demo and have a wrecking ball of a time.



## BUMP AND GRIND

The most recognisable vehicle from the *Monster Truck Madness* roster is Fred Schafer's Bear Foot, a vehicle immortalised in *Knight Rider*, and a ZZ Top video. A three-time monster truck world champion, it was also the first to climb a school bus, the first to cross the Mississippi, and even features in the *Guinness Book Of Records* for a 141-foot long jump.



left: Clever lighting effects transform the vehicles into curved beauties – if you've got a 3D card, that is...



right: The driver's eye view can be a little cramped, but the high-seating position and wealth of dials is suitably authentic.

below: Another stunning in-game shot – this sort of external cam view is no use for driving, but looks great.



above: It's possible to play in dusk, night, or pitch black – the headlamp glare effects aren't just for show.

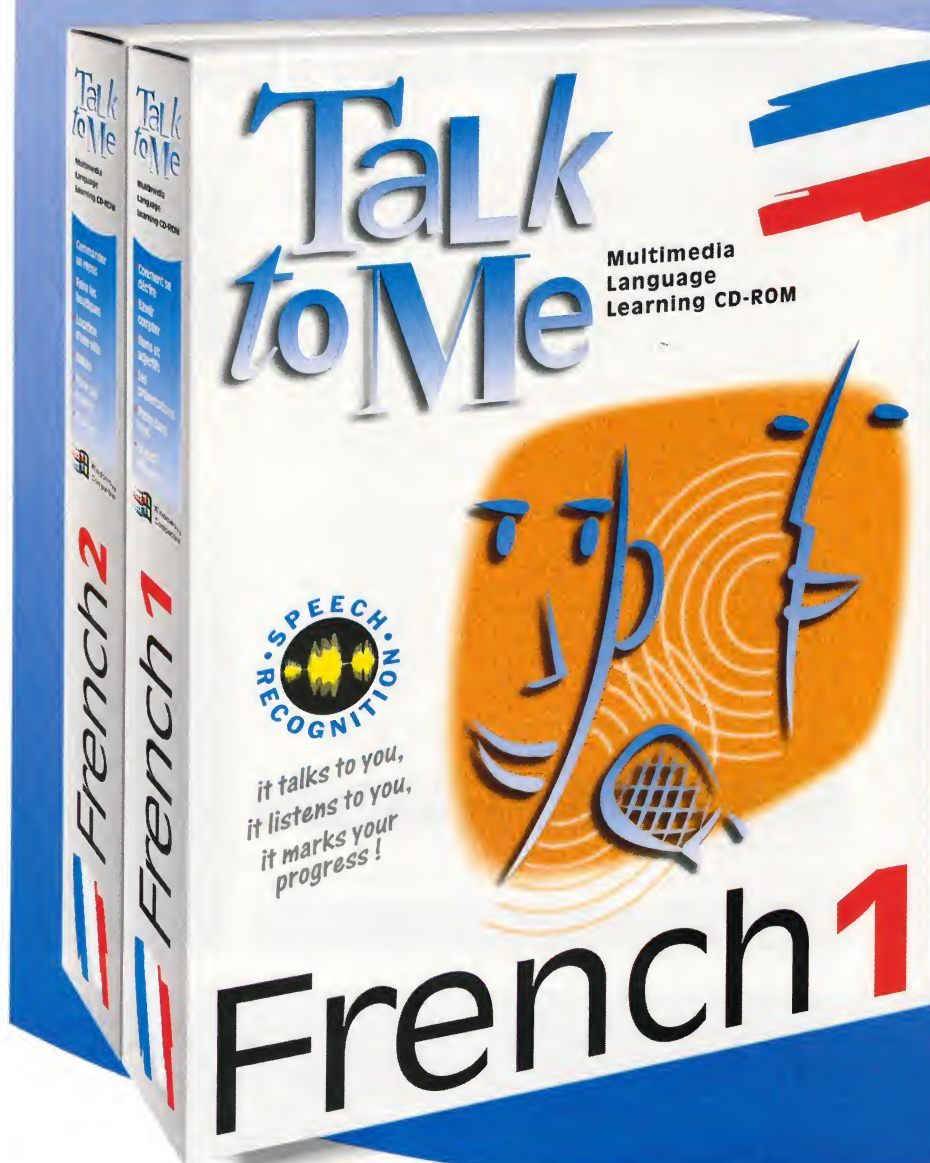


right: And if that sort of visual effect doesn't impress you, how about some reflective water?



above: *Monster Truck Madness 2* in action. Who needs pre-rendered footage when the in-game visuals are this good?





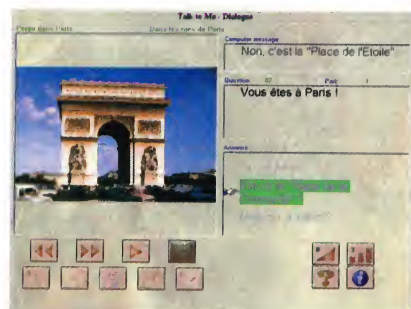
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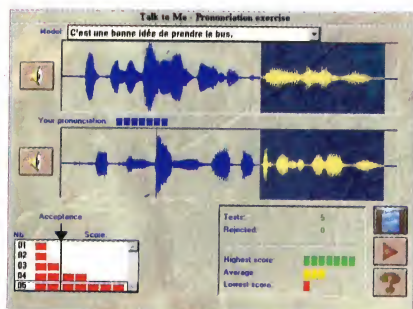
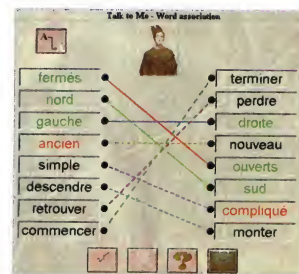


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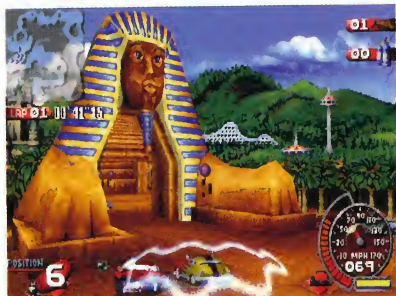
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# games roundup

The remainder of this month's games pile reviewed. BY MARK RAMSHAW AND TIM CANT

below: *Wreckin Crew* sports a speedy 3D system, but fairly basic visuals.



## WRECKIN CREW

Like the *Micro Machines* games, *Wreckin Crew* is the sort of madcap car racing game that doesn't give two hoots about realism, preferring instead to highlight bumps, weapons, speed boosts, and daft course ideas. Unlike *Micro Machines* the viewpoint used is a full 3D, third-person view, immediately recalling Nintendo's own *Mario Kart* games. These are famous for offering oodles of family fun, and Telstar obviously hopes *Wreckin Crew* will prove just as lovable.

There are number of reasons why this doesn't happen, not least because the presentation, from the front end to the design of the various driver



left: *The two player mode is fun, though still a touch primitive.*

characters, to the in-game visuals, never even begin to look as well-thought out as those of Nintendo's efforts. The 3D system, while speedy, lacks subtlety or grace. Certainly the game nips along at a decent pace, with plenty of animated 3D scenery. But textures are blocky, and the decision to use a 256 colour screen mode gives things an annoyingly dated look. Even the cars themselves look terribly blocky – this is a bit daft really when the player's is visible on screen at all times.

Even with these compromises,

control is never as fluid as it should be, with too much emphasis on simple steering and not enough on skids, inertia, and the like. Sure this is anything but a simulation, but that doesn't mean the control system should be this simplistic.

To the game's credit there is some invention here, not least the ability to find alternative routes around the various courses. While upping the longevity, it also serves to keep the player separated from the competition even more. It's all very well giving us

player access to side-shooting guns, and various other collectable weapons, but all too often the other cars are off-screen. At least the obligatory deathmatch arenas make more use of the car war aspect.

*Wreckin Crew* can be fun in short bursts, but it's hard to ignore how out-of-date everything looks and feels. And while it's all very well packing in loads of courses, secret shortcuts, and playing options, there's no getting around the fact that behind the extras lies a pretty basic racer. Time, it seems, has passed *Wreckin Crew* by.

Price: £34.99

Publisher: Telstar Electronic Studios

Contact: 01932 222232

six out of ten

## HEXPLORE

Once touted as *Gauntlet 3D*, now just plain *Hexplore*, this really is an oddity. For a start, it uses what appears to be a voxel-based system to generate scenes that look like old-fashioned sprite-based ones, but give the player freedom to rotate the viewpoint through 360-degrees. And all without the need for a mega-sized PC. But while novel, it doesn't actually add anything to the gameplay. Plus, it's a system that lends every character, object, and bit

*continued over*

## Total Annihilation: The Core Contingency

These days software publishers are practically bound by law to release a data disc for their real-time strategy efforts, and not wanting to rock the boat GTI has cobbled together a CD for owners of its top robot-driven *Total Annihilation*. The amount of stuff you get is impressive: 25 new missions (that's a new campaign for both *The Core* and *The Arm*) including one absolutely gigantic, tough as nails mission for experts, 30 new multiplayer maps, plus a mission and map editor. For those without Internet access a large selection of new units (75 in all) that have previously only been available from the official Web site are now also on this splendid upgrade disc.

Like most other add-on discs, *The Core Contingency* has been designed with the experienced player in mind. There are now so many units to think about, and the enemy forces are so tough, that if you're not a *Total Annihilation* champ then things are going to get more than a little tricky for you.

Of course, if you found the original missions to be a little

lacking on the challenge side, then *The Core Contingency* is going to be right up your rock-hard alley. Plus, if you're of a multiplayer bent then the handy editor and new, fully automated tournament screen will make you want to jump back and kiss yourself. The new world graphics are extremely impressive, ranging from lush jungles to futuristic cities, and the new units include a gigantic new robot fellow.

The downside is the price. We feel £24.99 is a lot to pay for what is no more than a mission disc, even for one as comprehensive as *The Core Contingency*. Bearing in mind exactly how much free stuff is available from the official *Total Annihilation* Web site the price seems even more perplexing. However, strategy fans, if you've got an unstoppable yearning for more TA campaigns there's no alternative, so this disc is quite simply a must.

Price: £24.99

Publisher: GT Interactive

Contact: 0171 258 3591

eight out of ten



above: *Strategy games don't get much better looking than Total Annihilation.*



right: *A giant Core robot bites off more than he can chew.*





above: *Hexplore* features a rather entertaining 360-rotation system. Great fun.

right: The point-and-click interface tends to get unwieldy when attempting to control a party of four.

of background a worrying dated look, the blocky and overly-bright images recalling the days of the Amiga computer.

More promising is the control system, which goes for a point-and-click approach to multi-character control. What with the fantasy setting and this user interface, *Hexplore* feels a touch like *Warcraft*, but with the emphasis on exploration and arcade-style combat rather than any empire-building malarky.

Even the tired old heroes versus monsters tale has a couple of neat twists, the adventure kicking off when a bunch of knights on their way to the Crusades are ambushed by scary beasts, and continuing in a plot-driven fashion from there.

What with the ability to recruit extra characters into what begins as a party of one (and can swell to four), and chat to the locals in search of vital clues, it feels like some kind of *Ultima* for the MTV generation. Granted there's little in the way of depth here, and the puzzles are usually of the 'retrieve the object that's handily close by' variety, but provides a welcome respite from all that sword wielding and spell-casting. Which is just as well, because combat really is excruciatingly basic. This is one element that really hasn't moved on a awful lot since the original *Gauntlet*.

Multi-player options (including Wireplay connection) do manage to add a much needed touch of modernity to the proceedings, but what with the graphics looking well past their sell-by date, and combat – the very heart of this sort of game – proving so simplistic, *Hexplore* always feels more like a history lesson than anything. And if it's history you're after, then the recent *Ultima* games do this sort of thing better anyway.

Price: £29.99  
Publisher: Infogrames / Ocean  
Contact: 0161 832 6633

six out of ten



## ON THE BALL 2

Of all the most unlikely yet popular breeds of computer game out there, the football management simulation has to be the oddest. Empire building meets

spreadsheet management for the Nick Hornby generation, these peeks into the analytical side of the sport really should be dull as dishwater that's seen one too many dishes. Yet the best of them somehow manage to make statistics and endless decision-making menus something rather magical, the depth proving irresistible for a nation of football fanatics.

The original *On The Ball* offered something a little different from the norm, looking at the sport with less reverence than most, the team training, ground control and other day-to-day manager duties coming with a side order of girl trouble and fast cars. Now, a good few years down the line its German developer has come up with a more complex look at footy management. The comic touches remain, but this time such brevity is balanced by some detailed serious content.

Naturally there's also a whole lot more polish this time round, with all the Windows-based menus overlaid onto artsy backdrops, the decision icons usually represented by a cartoon football character, and full 3D playback of matches. In fact, while obviously not interactive, the level of detail here is just as good as in some regular football simulations. Getting to see games played out this clearly definitely adds to the tension, the effects of pre and mid-match decisions unfolding in real-time.



above: *On The Ball 2* features full 3D playback of matches. A neat touch.

Those who prefer to focus on the less visual side of things will also find much to entertain, the level of detail extending from transfers, drug-tests, and sponsorship deals, right through to determining the weekly training schedules, and fan ticket giveaways. There's even negotiation to be done before you can begin your career, with the ability to haggle about salary, bonuses and all kinds of extras.

Granted, the lack of authentic statistics and hardcore seriousness means *On The Ball 2* will never compete with real football management muscle. But it provides a knockabout alternative. And who wouldn't relish the opportunity to make it to the top of league while simultaneously making dodgy deals?

Price: £39.99  
Publisher: Funsoft  
Contact: 0049 2131965112  
seven out of ten



## COASTER OF THE MONTH – UBIK

Espresso, cappuccino or au lait, whatever the flavour our desks need protection...

*Ubik* the game is based on the book of the same name by top science fiction author Philip K Dick. Although the name might not be familiar to you, you'll certainly have heard of his work. His stories 'Do Androids Dream of Electric Sheep?' and 'We Can Remember it for You Wholesale' inspired *Blade Runner* and *Total Recall* respectively. In this particular world of Dick's you are cast as the leader of a squad of heavily armed psychics whose task it is to hunt down rogue psychics employed by a sinister corporation that has got City Hall in its pocket. So, a pretty exciting prospect but has the developer, Cryo, done a man's job?

You may remember Cryo from last month's roundup, where their potentially intriguing *3rd Millennium* disappointed us with its lacklustre execution. Sadly it appears we've got a similar case on our hands with *Ubik*. The idea – a futuristic strategy game a la *Laser Squad* with adventure overtones (and in real time) is a good one. However, this is of little consequence as playing *Ubik* is an experience totally devoid of any satisfaction. You tell your squad who to shoot, they go for it, and if you're lucky they don't get slaughtered. What's more, there are a large number of slightly irritating things about this game that contrive to drive the player nuts. Everything takes an



above: Odd camera angles are *Ubik*'s speciality.

left: Perhaps you can make out your squad in the top left hand corner of the screen?

age to load, the camera angles are often completely useless and will change at exactly the wrong moment (admittedly you can turn the auto-camera off, but then you have to keep bashing the space bar to keep up with the action), and even in easy mode it's so tough you have to just keep plugging away at missions again and again until you eventually manage to get lucky.

*Ubik* is sadly another terrible wasted opportunity, and rather than being buttock-clenchingly exiting to play it's simply a case of bashing away until you get to the next mission. Pretty dire.

Price: £39.99  
Publisher: Cryo  
Contact: 01926 315552  
four out of ten





left: Preparing for battle against the mighty Watford with On The Ball 2.

just plain crazy. Chances are every single person who tries their hand at *Rising Lands* will repeatedly forget about this, sending farmers, soldiers and the like in entirely the wrong direction time and time again.

And why is it that placing one of these characters into the central 'sanctuary' building strips them of their abilities and returns them to the roster of untrained hands? Accidentally send a mechanic to the sanctuary – not too hard given the problems with that control system – and if you want him back extra resources must be used to train him up. Again.

A laborious and awkward variation on an already over-subscribed theme, *Rising Lands* just doesn't stand a chance.

Price: £39.99  
Publisher: Infogrames / Ocean  
Contact: 0161 832 6633  
five out of ten



right: Those buildings, that viewing angle – there's something kind of familiar about *Rising Lands*.



left: So this is what'll happen to the world if a meteorite strikes? Can't wait.

## RISING LANDS

What the world doesn't need right now is another point-and-click real-time strategy game, but since that message doesn't seem to have got through to the people who write PC games, it looks as though we'll have to endure a whole bunch of me-too titles for a while yet.

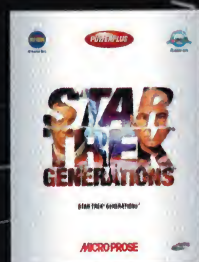
Like *Rising Lands*, for instance. Which if not, thankfully, a direct *Command & Conquer* clone, does bear a worrying resemblance to *Settlers*. Hell, the manual even uses that word to refer to your faithful flock. There are some differences, most noticeably the lack of roadway to connect buildings, and a simpler (though ultimately less fulfilling) way of handling the tasks of construction and resource collection. *Rising Lands* also shows a fair interest in combat, too, with multi-player

support, and later levels making defence against enemy clans and unsavoury post-apocalyptic (this time from a meteor rather than war) creatures a high priority.

The problem is that, while not badly misjudged all the game elements, bar the handling of alliances and inter-clan trading, feel way too familiar, and even the graphics have that 'haven't we met before' air to them. Pace is also a problem, with early levels in particular focusing on little but the construction of vital buildings. But then starting a new level usually involves starting the whole process again, so any sense of achievement here is lost.

The user interface also does its bit to scupper the success of an essentially sound formula, proving far less intuitive than that of years-old strategy titles like *Dune 2*. Forcing the player to deselect each unit before selecting another is

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right: Score two penalties against the Monopoly man and earn an extra throw.



below: Fancy buying the Stade de France? It's yours for £200.



However, Scotland could well be a bargain buy owing to *Monopoly*'s match play feature. The PC selects two teams and simulates a game between them, promoting the winner to a higher value position and relegating the loser. It's a neat touch and all the more disappointing that other aspects of the game, such as transfer and signing-on fees, have absolutely nothing to do with the World Cup.

There are some other small niggles too. Even in the full-screen mode you can't actually see which team is which unless you click on the board to bring up an enlarged view. And when your player moves around the board he'll often bounce his football, making it more like America's NBA than the beautiful game.

The missing element in computer

below: Here is *Dracula*'s simple management section.



The actual battle section of the game is unsurprisingly rudimentary, with a selection of six different units in total from regular footsoldiers to kick-ass cannons. Units can be grouped as you'd expect, and you can instruct your troops

left: Nice to see gratuitous amounts of blood in a strategy game.

*Monopoly* is, of course, the illicit thrill of rifling through your stack of cash and handing over crisp £100 notes. Or conversely, the harmless fun of blowing your wad in a single evening. Here the PC handles all cash payments, so half the fun is lost.

In other ways, *World Cup Monopoly* makes perfect sense. In place of the familiar utilities are lighting and soft drinks companies. We wonder if it's the official tournament soft drinks company. In *World Cup* capitalism, the official stamp of approval is all that matters.

Price: £39.99

Publisher: Hasbro Interactive

Contact: 0181 569 1234

five out of ten

## DRACULA

Perhaps surprisingly, *Dracula* isn't the creepy point and click adventure you might expect, but rather a *Warcraft*-style strategy affair. What's more, it appears that you're not out to slay Dracula – you *are* him. And no, you don't get to bite any virgins. Instead you're in charge of a rag tag bunch of medieval freedom fighters whose quest it is to free a Valachy from the cruel clutches of it's Turkish overlords. This is done by re-claiming various regions of Valachy in the real time strategy section. Once you've conquered a region then you can put the resident peasants to work building up your armies. If you've got the resources you can research advances in weapons and architecture, but you've got to make sure you keep your territory well defended: occasionally your enemy will attempt to retake your hard-won regions. If you manage to take the entire country back and oust your foes then you've won the game, and you probably get to go back to being a professional vampire, or something.

## Project Airos



above: Hardcore Humvee action a-hoy with *Project Airos*.

*Project Airos* is a real-time strategy affair, so you just know that the words 'Command' and 'Conquer' can't be far off. Well, here they are: this game is a *Command & Conquer* clone, but it's got – yes! – a gimmick. Rather than being some sort of general whose task it is to guide his forces through various battlefield scenarios, in *Project Airos* you're in charge of a corporation that specialises in providing mercenary task-forces. If you so choose then you can not only lead your units in battle, but also have a flutter on the stock market and take control of your corporation's research and development departments.

Once you've got a commission you are thrust into the battle section, where everything looks just as you'd expect it. The mouse controls take a little bit of getting used to, and it doesn't seem to follow the same sort of logic that the other games in this genre adhere to. Thankfully though you can of course group units in the now traditional way. The theatres of conflict are generally split up into four areas – your home base and tertiary, secondary and primary targets. You can move your troops between these battle zones via a map screen, where you can also see the approach of enemy task forces.

right: Your plush *Project Airos* office. The action doesn't happen here.



It's all quite jolly, but naturally there are a few problems. The graphics, while competent, are shamed by C&C's own three year old efforts. As mentioned previously the controls are a bit funny, and selecting large numbers of units can be tricky. There are no *Total Annihilation*-style way-points, but you can place *Battlezone*-style nav-points, which is some consolation. Also, when things get crowded units start driving over each other and the wreckage of their fallen comrades. It's looks quite bizarre, really.

*Project Airos* is a pretty good game, but you won't believe that a man can fly, and by the time the next generation of C&C clones have arrived it'll start to look very long in the tooth department indeed. You should really save your cash, but if you splash out you probably won't be disappointed.

Price: £39.99

Publisher: Ocean/Infogrames

Contact: 0161 832 6633

seven out of ten

to behave in one of three manners: cowardly, neutrally, or bezerkly. This isn't the slickest strategy game you'll have ever seen, nor is it the prettiest. There is a pleasingly large amount of blood on the screen when things get messy, and your troops seem to enjoy getting stuck in, so it's quite good fun. Mind you, to claim a territory for your side you have to eliminate *all* enemy resistance, so once you've taken over your opponent's castles you've still got to go on the lookout for stragglers.

*Dracula* is a little bit different to your average strategy game, and even though it isn't a top drawer piece of work the budget price helps make up for the lack of sophistication. However, if you're not really too concerned about splashing out it might be a better bet to go for a recent full-pricer.

Price: £39.99

Publisher: Softkey

Contact: 0181 246 4000

six out of ten



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# re-issues

More blasts from the past in this month's selection of retro games. **BY GRAHAM SOUTHORN**

right: *The forces of light and darkness do battle in Dark Earth.*



## bargain of the month: Interstate '76

The Abba revival started it all, lava lamps and *Boogie Nights* kept it going. 70s retro is now cool enough to extend beyond clothes and movies to the very modern world of computer games. And what a good one Activision came up with a year ago. *Interstate '76* is a car-chase action game in which you play the sideburn-wearing vigilante, Groove Champion. Groove is out to avenge the murder of his sister by bad guy Carlo de Funghi and rid the roads of profiteering criminals intent on holding Texas to ransom. This is an alternative 1976, you see, in which oil is scarce.

*Interstate '76* succeeds where many other games have failed in tying together action with an engrossing storyline. The story-telling sequences use graphics from the game, but primarily it's tips from co-driver Taurus and training sessions from your dear departed sis that set the scene. That and a glorious blast of funk.

Activision Essential Collection ☎ 01895 456 700 / £9.99



### Beasts & Bumpkins

Like its title suggests, *Beasts & Bumpkins* is set in a medieval world in which peasants grow crops, procreate and build things. Like other god games, your job is to help them keep the population high in order to rake in the profits from farming. This involves acting as matchmaker to the more intelligent peasants so that the next generation at least know how to harvest. And so it continues, with the later levels introducing such outside threats as wild dogs. The higher levels culminate in a full-scale war with invading demons. On paper it doesn't sound too bad but *Beasts & Bumpkins* fails to deliver. The graphics look outdated and the bumpkins' West Country accents are shamefully stereotypical.

EA Classics ☎ 01753 549 442 / £12.99

### Dark Earth

*Dark Earth* is an adventure game set in a *Mad Max*-style future with the planet in ruins and a future that's far from bright. In fact, the atmosphere is disturbingly dark because this is an earth dominated by machinery, medieval superstition and religious fervour. And it looks simply stunning, with 200 *Myst*-style rendered locations as detailed as they are colourful. What's more the characters are animated in 3D and although they're guilty of over-blown movements they're superbly rendered in real-time when you see them close up. You play Arkhan, a Guardian of Fire, who must find out why light itself is threatened by evil forces. There's some fighting as well as solving puzzles in this lavishly-produced game.

Microprose Powerplus ☎ 01454 893 893 / £11.99

### Star Trek: Generations

*Star Trek: Generations* is the game of the movie that brought the *Next Generation* crew to the big screen while waving goodbye to

### BUDGET NEWS CARMAGEDDON TO WREAK MORE HAVOC

GT Interactive's car-and-crime game *Carmageddon* will be re-released at a budget price next month. *Carmageddon* became one of the most controversial games ever when it was released in June last year, with the moral majority blowing up a storm over its violence. The game as originally designed involved driving over pedestrians, a theme which didn't endear it to the British Board of Film Classification (BBFC). Initially refused a certificate, publisher SCI appealed against the decision, which was eventually overturned. In the interim, SCI released a censored version featuring zombies instead of people. A later release – the Splat Pack – contained the full quota of gore.

Captain Kirk and the remaining Enterprise veterans. The basic premise is the same. The evil Dr Soran is intent on destroying whole star systems purely to divert the Nexus – a paradise vortex travelling through space. The game itself is an innovative blend of strategy, action and adventure. In the Stellar Cartography room you check star systems and planets for clues. And when you come into contact with enemy ships, the mode of play switches to a tactical combat sim. The mission-based episodes, in which you beam down to different planets, add to the Trek feel.

Microprose Powerplus ☎ 01454 893 893 / £11.99

### Need for Speed 2: Special Edition

*Need for Speed 2* is a cross between a realistic driving sim and an arcade action game. So what makes this edition special? Well, undoubtedly it's the enhanced graphics if you have a 3Dfx-compatible 3D accelerator. There's also a brand new track and three new vehicles. So you now have the chance to pit a Ferrari F355F1, Ford Mustang Mach III, and Ford Indigo and Nazca C2 against the original eight supercars. One of the best things about the game is its multiplayer mode in which you can race up to seven other players over a network or modem link. Even better, there's a split-screen option for driving head-to-head on the same PC.

EA Classics ☎ 01753 549 442 / £12.99

### Cricket 97: The Ashes Tour

Good cricket games are rarer than an England Test Match victory. *Cricket 97* sounds promising, with EA's usual high standards of presentation and commentary by Richie Benaud. But like England, it fails to deliver. It's partly down to the ropey bowling method, which involves selecting the type of delivery and then pressing a button to release the ball. Batting isn't much better. You choose the



# RETRO PERSPECTIVE

Scott Krager tells PC Review how Activision put the funk in *Interstate '76* and about plans for an equally stylish retro sequel.

## Are you proud of *Interstate '76*?

Absolutely. From the beginning we wanted to create a game that was nothing like what players had already experienced and I feel we succeeded. First, we successfully integrated a linear narrative into a 3D combat sim – a genre not known for strong story and characters. One standout component of *Interstate '76* was the manner in which we created an interactive movie of sorts. Players loved the story and characters because the story itself was written and told in a very cinematic manner and gameplay was not sacrificed to tell the story, rather the two complimented each other. In relation to the music, just listen to the soundtrack and you'll hear a full-piece, pro-musician funk band recorded in a traditional Los Angeles music studio.

## Did *Interstate '76* change PC games forever?

Only a very small handful of games, like *Doom*, can be credited with that. Rather I look at games like *Interstate '76* as taking the first step toward revolutionising how games are made. I see it as more of a collective effort on the part of multiple games and companies. I think *Interstate '76* forced other developers to rethink how 3D vehicle combat sims are made because it was certainly one of the most innovative. So, do I think *Interstate '76* changed games? Yeah, absolutely – a definite hall-of-famer that I think will lead to other more technically advanced and innovative titles.

## How would you do it differently today?

I would have liked to ship the game with 3D acceleration out-of-box instead of having to do a follow-up patch. It wasn't as big an issue at the time because the hardware was still coming into its own, but it certainly is in today's gaming market. Other areas that I feel could have used extra polishing include a better framerate – it was a little too slow on low-end systems. We also felt it was worth adding Internet support but didn't have the chance to fine tune it as much as we would have liked.

## What are you working on now?

We're currently throwing around different ideas but nothing definite has been decided yet. We are focusing on more straightforward action ideas rather than car combat simulation but rather. But if you're wondering whether there is a full sequel to *Interstate '76* in the works, the answer is yes. Zack Norman, who was the lead designer on the original

game, is directing *Interstate '82*, which started production as my team was finishing the Nitro add-on pack. Based on what I've seen, *Interstate '82* will be a huge leap forward.



above: Producer Scott Krager put the flair, not to mention the flares, into *Interstate '76*. And below him, is his alter-ego.



above: *Data and Picard wonder when they'll encounter Kirk in Star Trek: Generations.*



above: *An Aussie batsman faces a rare straight ball from an England fast bowler in Cricket 97.*



above: *Put a 3Dfx chip under the hood and enjoy an enhanced Need for Speed 2.*

above: *The road to hell is paved with 70s fashions in Interstate 76.*

shot you want to play and then hit a key to take a swing. Frustratingly, the shot you pick doesn't make much difference because it mostly comes down to timing. Also included with this re-release is an add-on pack that enables you to recreate England's spectacular defeat in last year's Ashes Tour.

**EA Classics** ☎ 01753 549 442 / £12.99

## Air Warrior II

*Air Warrior II* is an air combat game aimed squarely at the flight sim enthusiast, with 35 aircraft to pilot, 300 missions to fly and an awful lot of keys to learn. There are also three campaigns to choose from, covering both World Wars and the conflict in Korea. Years ago, *Air Warrior* was one of the first combat games you could play in real-time against human opponents over a modem. You can do the same in *Air Warrior 2*, but the rest of the game is considerably less cutting edge. Even though the graphics are oddly simplistic, the game engine is poor enough that they run jerkily.

**Blue Byte** ☎ 01604 259 090 / £9.99

## NHL 97

EA's sports sims were always something of a compromise, going for a level of realism and graphics that left all but the latest and greatest PCs gasping for breath. But by the time *NHL 97*, there were chip speeds to match EA's ambition. This, then, is the American way of ice hockey – fast, furious, brutal and fun. The *NHL* players sport authentic jerseys on their polygonal frames and a variety of grimaces on their texture-mapped faces, and skate onto the ice to a blast of rock from the stadium PA. The controls include buttons for speed bursts and other special moves, and computer-controlled opponents are a tad smarter than in previous versions.

**EA Classics** ☎ 01753 549 442 / £12.99 **PCR**

## BUDGET NEWS DARKER EARTH

*Dark Earth* is re-released this month, so we've taken a timely look at developer Kalisto's dedicated Web site. Dedicated the players of *Dark Earth* most certainly are, because it includes a club you can join for free. Membership entitles you to download patches and discuss the epic struggle between good and evil, or something, in the chat Forum. And if you're tired of talking you can play a live game of Yong. Yep, even the names are strange in the peculiar future of *Dark Earth*.



- 3 UTILITY
- 4 NAV BEACONS
- 5 FACTORY
- 6 FACTORY

SPACE Select Scavenger  
ALT No Action



above: Close-range combat on a planet far, far away.

# BATTLEZONE

Complete the Soviet and US scenarios with this stunning conclusion to our Battlezone tips. **BY TIM CANT**

## next month

Face the Zergs in our StarCraft mission guide.

Last month in PC Review we guided you through the trials and tribulations of *Battlezone's* first 16 missions. Now we finish off the final two US missions and take on the awesome might of the Soviet side of the game. Prepare yourself for the nail-biting climax

### AND WE'RE OFF...

At the beginning of Mission 17 deploy the Recycler and Unit Factory right away, then build a Construction Rig and fortify the entrance to your base (before it begins to slope down) with Gun Towers, but don't block it entirely. Move the two Turrets to protect your Recycler, and begin the construction of offensive units. When you've got about eight, start taking out the towers. When you take out a tower you'll see a geyser appear. Once you've knocked out all the towers and the minefield is down you can move your MUF and SLF up to the set of two geysers. Later you can build a scrap silo there. Ignore the four main factory buildings, and go for the Power Converters behind them – once they are destroyed the factory will be disabled.

To start Mission 18 off on the right foot build two Scavengers and three Turrets, then churn out as many offensive units as you can. Place the Turrets around your Recycler. Head north towards the Transport, and once you reach it quickly destroy each of the thrusters. Once they are taken care of, peg it back down south to where you started, then take the path that branches off south-east. Get back as soon as you can, or you'll be left behind (don't wait for your units to follow you, as it's every man for himself). That's the US missions dealt with.

### BACK TO THE USSR

Begin Mission 1 by building a Construction Rig right away, then drive up the river bed and build a Silo in the main clearing where the passes

converge. Build more Scavengers until you've got four, then move all your offensive units and Turrets (bar the Walker – keep it where it is) into the clearing to prepare for an ambush. Get some MUF action as soon as possible, and start building more defensive units too. You'll get a warning that the American forces are moving, and shortly after you'll be told what pass they are heading down. Immediately move your Walker to the Walker cut-off Nav Beacon, and set up your Turrets just inside the exit of the pass they are heading down.

Line up your offensive units behind them, and when the Recycler cops a load it will start to retreat. A few escorts will attack your ambush party; hold back and let them engage the turrets. Order your offensive units to take out the Recycler (and escorts too, if you're not capable of dealing with them yourself), and once it's destroyed, fortify the clearing with Gun Towers and Turrets. Place the Gun Towers facing north-west so they can pick off the reinforcements that come later in the mission. Place Turrets at the middle and lower exits to pick off any units that try to attack from the American outpost. Now build offensive units, and head for the base. Once you're there blast the power supplies, then take out the silo and give that MUF a licking.

You'll need to utilise your grouping skills in Mission 2: start off by organising your offensive units into two groups mapped to [F1] and [F2]. Order them to attack the two incoming units as soon as they appear on your radar. After the cut-scene order them to attack the two other incoming units as soon as they appear on the radar.

### BEWARE THE BLACK DOGS

There are two ways to complete the mission from here. The first method is to take the route laid out by the Nav Beacons. Organise your units into three or four small groups and roll out. Once you get to the second Nav Beacon four Black Dogs will come from the



below: *Turrets come in handy once again.*



right: *Gang up on lone enemies for cruel yet safe entertainment.*

left: *More long-range laughs with the Sniper Rifle.*



above: *The Fury aren't really that furious, but they're not very nice all the same.*

mountains to the south. Quickly order your small groups to attack one each, and join the fight yourself. If your transports are heading directly to the launchpad, stop them. Once you've killed your assailants, start moving again. You'll be warned about enemy artillery, so order your small groups to attack them.

Immediately order your Transports to follow you, and make sure they keep moving. Guide them round the minefield that the Black Dogs laid in your path, and once all the Transports have cleared the minefield order them to head straight to the launchpad. Recall all your offensive units to join you, follow the Transports and zap the attacking units that come in south-west of the launchpad. Once the Transports reach the launchpad the Black Dogs will retreat.

The second method is to go directly south and try to cut behind the mountains which follow the southern route of the pass. If you attempt this method you need to stay far to the south of the mountain so as not to alert the main platoon which is waiting there. You'll come to a security net that runs north to south. You must take it out, because if you pass through it the Dogs will be all over you. Order the convoy to stop about 200 meters before the net, and move slowly up so you can just see the camera. Shoot it out, then move quickly to the one that was next to it, and shoot that one out as well. Now move your convoy through as quickly as possible. Make sure they go through the area you just cleared or you're stuffed. Shortly after you take out the net the Black Dogs will send some Scouts to investigate – get out of there before they show up. Once you're through move quickly to the launchpad. It won't be long before the enemy is on your tail, so use small groups of units to take out any attackers before they get close to your transport.

Mission 3 is much more simple. Take the upper or middle route, as the lower route has mines to be cleared, which takes too long. Once you learn there is a patrol coming, hide in one of the volcanic formations (cubby-holes) to the side. Hopefully you won't get spotted. Once the units pass by continue towards the outpost. Take out the Turrets guarding the entrance, then order your Bombers to destroy both Solar Arrays at the same time. Once the Gun Towers are crippled, take out the Recycler and scarp back to base – unless you're fast you're likely to encounter the Black Dogs on their way back.

## IO, IO, IT'S OFF TO WORK WE GO

The fourth Soviet mission takes place on sunny Io, but don't spend too long gazing in awe at the resplendent beauty of your surroundings. Instead, set up your Recycler and build two Scavengers. Build wingmen as you get scrap, and drive towards the bridge, taking out NSDF units as you go. Once you get to the bridge, take out the Howitzers around the bridge. One you have to drive across the bridge to get to, the other requires a jump, or the use of your own artillery to take out. If you do decide to jump, you

might want to make your way back. When you have eliminated all of the opposition on your way to the bridge send all your nearby units to defend it. Don't bother attacking the NSDF Recycler: once your Transports have crossed the bridge the mission is successfully completed.

Mission 5 is pretty dang simple, but it involves a whole lot of action, so 'Titan' your seatbelt for more moon-based mayhem. The first thing you've got to do is take out the Artillery on the ridge. When it's taken care of, blast the Walker and Turret at the base of the ridge. Rebuild your base defenses as necessary for the coming attack waves, and eliminate the NSDF Recycler when it's identified.

Titan is also the theatre of war for Mission 6, another simplistic scenario. Start off by Thumping your way through the minefield, and then use your Walkers to take out the Turrets. You'll need to leave some defenses around your Recycler to protect against the counter attacks. Use your Artillery or APCs to take out the Gun Towers in the canyon, and once you get through use Tanks or Bombers to blow up the field HQ. Sweet.

In Mission 7, it is imperative you don't attack anything on your way to the jail. When you get to the jail, position your APC close to it, then blow that sucker. Once the engineers are on-board the APC, head out of the NSDF base the way you came in (to the north), and head south-east. You've got to keep the APC with the engineers with you, or bad things will happen.

Follow the old CCA roads in the riverbeds to the three lost items: a Unit Factory, a Scrap Silo and a hidden Supply Hanger. Finding the Supply Hanger gives you two Scavengers you can take to the Silo and start collecting scrap with. Don't worry about losing units, just make sure the APC is kept alive as long as there are engineers on-board. Your real goal here is to take back your Recycler – once you've done that you can start building new units to replace the stuff you've already lost. Get your APC with the engineers in near your Recycler in the NSDF base (try coming at the base from the south-west). There is a passage-way to the Recycler to the west of the NSDF base. Just don't lose that engineer-filled APC, okay?

Now the final mission. The Big One. The Main Event. The Last Stand. It's very exciting, but sadly there's little MUF action to be had here at all. There's a large scrap field to the east of your starting position – set up a Silo there immediately and have your Scavengers collect scrap there. Try to stop the NSDF Unit Factory taking the centre, and attempt to incapacitate the NSDF by whacking the heck out of their Scavengers whenever possible. The NSDF won't attempt to attack your factories often, because they're more concerned with controlling the scrap fields. Finally, don't concentrate too much on building defensive units, and keep a good number of wingmen with you at all times. Good luck: if you fail, the US will gain control of the entire galaxy. Nightmare. **PCR**

## MINI TIPS

A sneaky little multi-player tactic that's sure not to endear you very much to your virtual tank-commander buddies is to lay proximity mines when you've just picked up a power-up (hopefully on the spot where the power-up will shortly re-appear). If you get it right this play will not only blow up your opponents, but also make them totally paranoid to boot. Nice one.

exact opposite to the MITS Mine: it generates a magnetic bubble that's about 3 meters high with a circumference of about 20 meters. Projectiles can't penetrate the bubble, but the vehicle inside it can fire out. A good tactic is to launch the M-Curtain and target a craft on the other side of the bubble with a guided missile. The missile will go round the bubble, then come back and zap the enemy.

## Need some help with your technique? Stick with us, kid...

As we pointed out last month, it's best if you've got a reasonable keypad set up. Set keypad [4] and [6] as left and right respectively. Make [ENTER] on the keypad 'slow' and [DEL] on the keypad 'jump'. Also, keep the keyboard handy at all times – getting caught in a tricky situation is all the more likely if you don't know what you're doing. Here's some handy advice on using the MITS Mine: MITS stands for Magnetic Inverting Tethering Snare, and the MITS Mine pulls in everything contained in its area of effect (about 200 meters). It's best used in conjunction with mortars – use it to draw both enemy craft and your mortars into the magnetic field. Once there, things get pretty rough for your opponents. The M-Curtain does almost the



# STAR WARS SUPREMACY

Even if you have The Force, *Supremacy* is still fiendishly difficult. Let us be your Yoda. BY TIM CANT



## next month

We bring you part two of the golden path to total *Supremacy*.

**S**upremacy is one tough strategy cookie. This is very much the real deal. There are hundreds of planets, tens of characters, and vast space-bound armies. It's a recipe for a headache, and no mistake. What you need is a two-part strategy guide from your friends at PC Review. Remember: there's no try. There's only do.

Right, so you're starting off your career as the shadowy unseen power that manipulates your chosen side, and with so many characters to look after, you're beginning to worry your head might explode. Fear not; here's what to do with your human resources.

If you're playing as the Empire, get the Emperor recruiting on Coruscant, with Vader taking care of Diplomatic missions. When you get Jerjerrod and Piet, use them as ambassadors too. Put Thawn on ship research as soon as possible, and when all that is finished you can use him as an Admiral. Veers and Covell are great for troop training, and Villar can be put to good use in facility research. Labanstal, Noval Garaint, Garidan, Menndo and the rest are your spying, kidnapping and sabotaging crew. When you've got some more characters with Force abilities get Vader to train them up.

If you're playing as the Alliance then get Mon Mothma recruiting right from the start until you've got all the characters. Put Han and Chewie on a Corvette with some other rock characters and use them as your spying (etc.) team. Lando is your man for facility design, while Wedge and everyone's *Star Wars* favourite, Admiral Ackbar ("Billbl! It's a trap!") should be packed off to ship design. The lovely Leia and the obscure Jan Dodonna are perfect for diplomatic missions. At first Luke is handy for that sort of thing too, but he's a special case. When Luke returns from Degobah try and get him to confront Vader or the Emperor. Luke's not stupid, and should manage to survive the encounter. What's more, his abilities will increase dramatically. If you let him encounter Vader or the Emperor again, then he'll become the most rock hard character in the game, and will soon become a Jedi Master. Once he's reached the exalted rank of Jedi Knight he can train others, so use him to make your other Force-capable characters even more powerful.

Another factor to consider if you're playing as the Alliance is where your HQ is situated. If it's close to Sesswenna of the Simitra sector (where Yavin lives), you should move it pretty early in the game. Systems like Orus and Xappyh are excellent, because they are miles away from the Empire power bases of Sesswenna, Corellia and Dolomar. Jospro and Glythe are pretty good too, and even Abrion is okay at a push. Send a transport right away to the system of your choice and let a regiment land on an unsettled world. Once that's done it's advisable to send your HQ there right away with some troops, just to be on the safe side.

Once you've colonised a lot of the Rim-systems you can move your base around occasionally to keep the Empire guessing. You should also make frequent espionage missions to the planet the HQ is located on to make sure there's no enemy activity or incoming fleets.

## HOW ARE WE DOING?

Now you know the score as far as the characters go, let's turn our attention towards building stuff. You should start off with at least one Construction Yard on one of your planets, and if you're really lucky you'll get a Shipyard and Troop Training Facility too. If you haven't got any of these, find the nearest planet that has a Construction Yard and use Diplomacy to gain control of it.

The best way to start off is to build up two planets in a system with two Construction Yards and one planet with three Construction Yards. Now check to see what else you've got in that system; there should be at least two Shipyards and two Training Facilities in each system. If there aren't, build them. When you're sorted, give each planet two GenCore shields and one LNR Series Laser. That way any fleet that attempts to bombard your planet will suffer serious losses.

If your maintenance points are running low at this point then you've got to build some mines and/or refineries (having equal numbers of each will help maximise your output. The maximum output is 50 per pair). If the Raw Materials Monitor number is larger than zero it probably means you have more mines than refineries. If the RMM number is always zero you need more mines.

If your planets are to successfully defend themselves from sabotage, espionage, fromage, uprisings and ground attacks they'll need stationed troops. The more troops stationed, the tougher a time your opponents will have causing you grief (unless they've got a Death Star, of course). Start your troop Training Facilities producing the cheapest ones available, and once they're completed send them off to be stationed somewhere. Make a point of checking the Trooper Requirement in the planetary overview, as if you don't meet this you'll eventually lose support on the planet, and ultimately lose it.

Try to station at least two trooper regiments on each planet, and station one of your characters on each of your most important planets. Promote them to General for maximum protection. If there are hostile planets in or near your system then you're going to need some help. Get your Troop Training Facilities to produce spies, guerrillas, and infiltrators or commandos.

Finally, you'll need some ships. So get your Shipyards working on a Capital Ship as soon as they are deployed. Since you probably only have one Shipyard on a planet, a reasonably good tactic is to build Escort Carriers for fighter squadrons. These are fairly cheap on maintenance and they only take about 130 days to build with one Shipyard. If you've got two Shipyards in a system, set the other to build about half a dozen squadrons to be attached to your Escort Carrier when it's finally finished.

For each system you have control of you should eventually aim to have a planet with five or more Shipyards or Advanced Shipyards, a planet with four or more Troop Training Facilities or Advanced Troop Training Facilities and two planets with three or more Construction Yards or Advanced Construction Yards. If you can afford it, have a



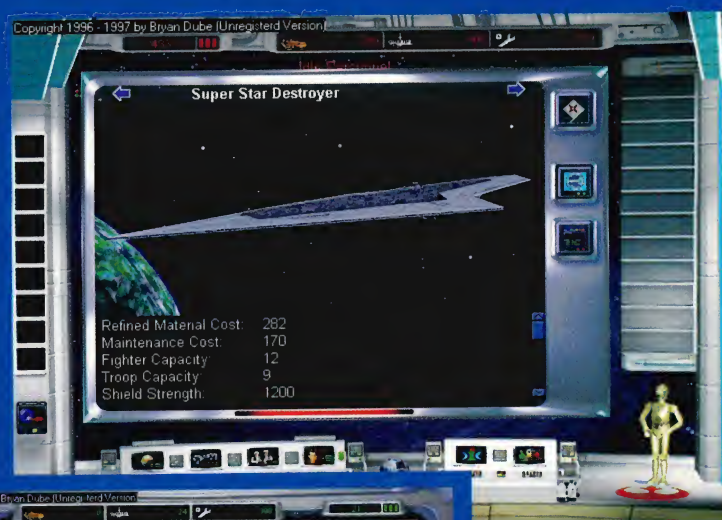
left: *Make sure the Emperor is well safe on Coruscant.*

below: *Keep your main base well defended (but not too well defended).*



left: *Star Destroyers arrive at Yavin (at little late, though, don't you think?).*

right: *Corellia, home of the Corellian Corvette. Presumably.*



above: *The scariest ship of many scary ships is the Super Star Destroyer.*

second planet with two to three Shipyards or Advanced Shipyards for making fighters while the other one is making Capital Ships.

## THE SAME AS ALWAYS

Diplomacy is one of the most important aspects of Supremacy. If you're playing as the Empire, the first thing to do is take control of your home system of Sesswenna. If you're playing as the rebels, it's probably best to go for the Farfin, Sluis or Fakir systems. Go for the planets that have facilities already built on them: Construction Yards first, then Shipyards and Trailing Facilities. Take over as many planets as you can, particularly if there's no enemy presence there. Once you've claimed a planet keep one character there to keep the popularity rating in your favour. If you take an enemy planet by force then the popularity rating will probably be against you at first, so keep a character there full time on a diplomacy mission until you've got full support.

As you gain control of one system send all but one of your diplomats to the next system of your choice and repeat the process. Eventually all the core systems will either be under your or your opponents' control. When this happens you can put your diplomats to work in other areas, until they are needed again on newly conquered enemy worlds.

Diplomacy is all very well and good, but more covert tactics are often just as necessary – and a lot more fun. Spies are obviously good at spying missions, but they're even better if you team them up with one or two characters who have good spying skills. Also, try using one of these characters as a decoy (characters with high espionage ratings are good for this).

The same rule goes for sabotage missions. Team up your saboteurs with a couple of characters and set one of them to be the decoy, but make sure the decoy has high combat and espionage levels. Nearly everything can be sabotaged, including facilities, ships and personnel. Abduction and assassination missions are much the same: use your Infiltrators/Nogri Death Commandos with a pair of characters and put one on decoy, but bear in mind your character's combat and espionage rating had better be higher than your chosen victim's. The consequences can be quite upsetting.

If you want to incite or subdue an uprising the skills evaluated are the leadership of your chosen character minus the loyalty of the planet to the other side. Watch out: if your opponent has got a General stationed there then your mission will probably fail, and what's worse, your character might well be captured or killed. Other factors to consider are what forces your opponent has placed in orbit, and whether there are any enemy troops on the planet or not.

## THAT BAD, HUH?

If you're feeling a little bit flash you can always try blockading enemy planets early on in the game. When a planet is being

blockaded the owner of that planet can't benefit from its resources and they'll also lose maintenance points. Wouldn't it be great if you could blockade all your opponent's planets?

Your opponent might have as many as 20-30 planets, and you'll probably run into something nasty when you arrive in orbit. Usually this would be fighters, but normally you'll encounter under half a dozen squadrons. The best ships to battle fighters are the Lancer Frigates and Corellian Gun Ships. Assault Transports and Corellian Corvettes are also a good thing.

Let's say you go for a blockade of 20 of your opponents planets. This will cost your side about 460 Maintenance Points, and your opponents about 600 Maintenance points. You do the maths. Not bad, eh?

If you just get 10 of those 20 to do a successful blockade for some years, your opponent will probably lose something due to shortage in Maintenance Points. What they lose is decided at random, but fingers crossed it will be important. It will also take them some time to chase away all your ships with their fleet, and by then you should be ready to blockade them elsewhere in the galaxy. Be careful, though: while you are concentrating on blockading, your opponent might just attempt to invade your home system, so keep your wits about you at all times.

You might arrive at a planet to build a blockade to find that the planet has, say, two GenCores, an LNR Laser, loads of troop regiments, a character that's a General and several other characters for backup. What do you do? You might like to try moving the fleet out and sending in personnel to perform sabotage missions. However, you can be pretty sure that your opponent will attempt to relocate his important personnel, so you might want to maintain the blockade. It's your call, so bear in mind this is a risky scenario, and you'll probably get some of your characters imprisoned or killed. Bring in your hardest characters: for The Empire you might consider Labansat, Darth Vader and Noval Garaint. The Rebels would want Han Solo, Chewie, Mazer Rackus and little Luke (it's seriously bad news if you lose him, though). Whether you are acting as The Empire or The Alliance, be sure to back your characters up with Spies and Infiltrators.

There are two simple choices when it comes to sabotage. One, is to go after the General and attempt to abduct him, making it far easier to defeat your opponent's disorganised troops. Two, go straight for the troops, making it easier to get to the LNR Lasers and GenCores. Keep in mind, your ultimate goal is to take out the LNR Laser and GenCore defences so that you can bombard the enemy ground troops from orbit, or even take the fight to the surface of the enemy planet.

Join us next month, when we'll attempt to impart some even more advanced tactics, and hopefully wipe your opponent's meagre little fighting force off of the face of the galaxy. Here's until then. **PCB**

## MINI TIPS

chances of victory. Send a few sabotage units or personnel along with your key battle fleets so that they can sabotage the shield generators on enemy systems. Try to avoid too many orbital bombardments, also. These can lower your popularity system-wide, which is a Very Bad Thing indeed.

you place one of your characters in command of them. A general enhances a garrison's defensive capacity, and also helps to foil enemy espionage missions to that system. Also, if you're The Empire, make sure you keep the Emperor on Coruscant. Remember to use all of the forces at your disposal to increase your

defended (especially for your most important characters), and also convenient for where that character's missions are likely to take place. Also, if a character looks to be in danger, don't be afraid to abort their mission: that is much better than losing them. When you deploy a key defensive garrison or fighter squadron, make sure

If it doesn't fit, don't force it. If you're not afraid to try the most feeble and pathetic of all tactics, then why not try saving before you attempt any plot that might be even slightly risky? If it all goes horribly wrong, you can simply reload your old game and breath an almighty sigh of relief. When choosing bases for your characters make sure that they are well



# PLAY TO WIN

Brace yourself as once again we prepare to **rock to the rhythm** of the funky cheats. **BY TIM CANT**

## CHEAT OF THE MONTH!: MOTORHEAD

When we reviewed Gremlin's *Motorhead* in issue 81 it was awarded a whopping eight out of ten, but we felt it was a little hard to get access to all the cars and tracks. However, it appears our prayers have been answered with a patch that enables you to choose any car or track right from the start. You can download the dirty, cheating little bit of software from: [www.avault.com/cheat/dl\\_mheadcht.asp](http://www.avault.com/cheat/dl_mheadcht.asp)

Once you've downloaded the file, just run it and it will update your game file to run with the cheat. Sadly there doesn't appear to be a type-in code to get the same effect, and these days the only way to cheat on a lot of games is to use a patch like the one we've

just covered. Here are a few sites that offer cheat downloads for other games:

[www.gamesdomain.co.uk](http://www.gamesdomain.co.uk)  
[www.avault.com/cheat](http://www.avault.com/cheat)  
[www.gamenexus.com](http://www.gamenexus.com)  
[www.quantumrealms.com](http://www.quantumrealms.com)  
[www.happypuppy.com/cheats](http://www.happypuppy.com/cheats)

For those unfortunate souls without Internet access, try this little doozy. On the personal options screen enter your name as 'Supercars' and your team name as 'Grem'. Now start a new game for a new twist on an old favourite. It changes the camera to an overhead view.



above: *Overtake Motorhead's difficulty levels with a cheat patch.*

## Redline Racer

Fans of this pretty but shallow *Racer* are already waiting for confirmation of the rumoured bus-based sequel, *Green Line Racer*. For those of you that are still having trouble with some of the game's trickier courses, here are some codes.

Enter your name as 'Abode' for access to every bike and all the tracks, or alternatively enter it as 'Dissent' for a bonus selection of various goodies.



Cheat and all Redline's tracks are accessible to you.

Whatsthepoint  
Wirewewaiting

F2  
F3  
F4  
F5  
F6  
F7  
F8  
F9  
F10  
F11

Turns the graphics to dots  
Turns off all textures  
Easy aim  
Invulnerability  
Infinite lives  
Infinite weapons  
Smart bomb  
Quit  
Stores current state  
Reloads stored state  
Frame rate on/off  
Restart

## Die by the Sword

Dumb orcs, greedy goblins and ugly ogres can prove all too much in *Die By the Sword*. Try these cheats to rid the dungeons of these evil races. Hold down [F1] and type in the cheat you require.

Murkor  
Dedly  
Golgr  
Briny  
Silky  
Lunar  
Peace  
Freez  
Bamff

God mode  
Improves your weapon  
Grow  
Shrink  
Freeze enemies  
Lunar gravity  
Kills all enemies  
Enemies can't think  
Teleport

## Incoming

Do *Incoming's* spectacular graphics addle your mind? Do you find that this compromises your playing skills? Give some of these codes a go. Hold down [Shift] and type:

Flatbroke	Shading off
Flymetothemoon	Moon racing action
Gouraud	Turns Gouraud shading on
Haveall	For the man who doesn't have everything
Masteroftheuniverse	This one's a secret
Oldmacdonald	Cows attack
Solidasarock	Invulnerability
Superdaisy	Kills everything



above: *There's no doubting he died by the sword.*



above: *Darklight needn't conflict with your skill level with this month's classic cheat.*

## CLASSIC CHEAT OF THE MONTH!: THE DARKLIGHT CONFLICT

This gorgeous little game was our Re-Issues' 'Bargain of the Month' in issue 82, where we praised its cunning use of lighting and grooviness in general. Here's a little tipette for those who are finding it that little bit too tough - during the game press [tab] and [page up] at the same time. Then hit [p], and if you've performed this trick correctly a message should appear telling you that you've activated the cheat mode. Now your ship is invincible, and you can generally do what the heck you like.



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# Multimedia & the Net

We're on a mission to seek out the hottest interactive information available — on the Net or CD-ROM.

## EYEWITNESS WORLD ATLAS

The world's your edible bi-valve mollusc with a virtual book of maps. **BY GARY TIPP**

### Section Contents

World Atlas	68
Motion	69
Browser	69
Plugged In	70
Cinema Site	71
Who's the Best	72
The Main Event	72
Bookmarks	73

**D**o you know the way to San José? Are you going to Scarborough Fair? Is it really 24 hours from Tulsa? Where do you catch the night boat to Cairo? And, yes, we know it's a long, long way to Tipperary but should we pack a lunch or what? All these song-related imponderables (and many, many more) are answered in full by the latest release from one of the United Kingdom's top multimedia publishers, Dorling Kindersley. The *Eyewitness World Atlas* is surprisingly the company's first stab at an encyclopedic reference atlas and, believe it or not, hasn't simply been designed to give inspiration to budding tunesmiths the world over. There's an awful lot of that stuff they call 'geography' attached too.

Dorling Kindersley has an impeccable record in developing and publishing CD-ROMs of the highest quality and the *Eyewitness World Atlas* is no exception. Along with an efficient

right: *The interactive 3D globe is the first thing you'll encounter.*

encyclopedia, an interactive book of maps is one of the truly essential multimedia purchases. Atlases on CD-ROM blow their print cousins out of the water on many counts. First up, the level of detail on a disc is far, far greater than the fruit of a printer's press. Then there's the small question of interactivity. You can't zoom in and out on paper and neither can you circumnavigate the world via a 3D interactive globe. You can with this title. Atlases on CD-ROM really do fulfil the rationale behind the original multimedia dream.



above: *Fly over the rivers of Europe...*



right: *...or take a trip to Afghanistan. The choice is yours with World Atlas*

### Where in the world?

The focal point at the top level of the *Eyewitness World Atlas* is the interactive 3D globe. It is available to view in three different modes (Physical World, Earth at Night and Political World) and will gaily spin on its axis until you tell it otherwise. It was Marvin Gaye who sweetly voiced his opinion that the world was like a great big onion and Dorling Kindersley seems to have taken him at his word. Click on the globe and it strips away, taking you swiftly to the next level of detail. The globe is also available in pre-Columbus mode and converts to a 2D model if instructed. All of this is performed with the measured flair and design-led simplicity that Dorling Kindersley is much loved and famed for.

Just as a multimedia encyclopedia lives or dies by its articles, so is the case with atlases and their maps. The cartographic cream rises

### A tale of two countries

One of the more informative features included on the *Eyewitness World Atlas* which helps raise it above the mediocre throng is the excellent World Ranking facility. From a huge database of fascinating country-related statistics, you're able to tailor the information to suit your own needs. We've opted to have a quick look at a couple of the biggest but starkly different countries on this God's earth — namely the United States and the People's Republic of China. Let's see how it pans out.

**Population**  
China 1, 234,300,000  
USA 265,800,000

**Life Expectancy**  
China 69  
USA 77  
San Marino 81 (highest)  
Ethiopia 49 (lowest)

**Car Ownership**  
China 1.8 per 1000  
USA 554  
San Marino 785 (highest)

**PC Ownership**  
China 2.2 per 1000  
USA 328  
United Kingdom 186  
Switzerland 348 (highest)

**Crime — Murder**  
China 1.9 per 100,000  
USA 9.31  
Azerbaijan 9.55 (highest)  
United Kingdom 4.05

**GNP per capita**  
China 530 US \$  
USA 25,860  
Luxembourg 39,850 (highest)

*Eyewitness World Atlas* is absolutely crammed with these statistical

gems, and courtesy of the World Ranking facility they're an absolute doddle to get at. Our conclusions on all this? Don't go to China if you need a taxi in a hurry, take a trip to Mongolia if it's solitude you're after, and think again about visiting Azerbaijan.



above: *China is not the place to become a car mechanic.*







above: Two of the four map styles: political and 2D respectively.

to the top with the *Eyewitness World Atlas* and all countries from Afghanistan to Zimbabwe are all represented in great detail. The maps come complete with a search feature which lets you zoom in and locate your destination instantly, as well as a device for measuring the distance between two cities. How far Tipperary?

Exploring the individual country screens takes you not only to some excellent photography and video clips but also to a deeper level of information. There are 17 different categories, such as People, Climate, Resources, Tourism and Crime, and each one holds a great deal of statistical data. What's more the World Ranking facility (see 'A Tale of Two Countries') enables you to present the data in a sortable list.

Should the world change overnight, there's no need to panic. As access to the private Web site of the *World Atlas* ensures that the information is kept up-to-minute. There's also thousands of hot links to relevant sites which add even more value.

Despite all this adulation for what is an admirable title, there's still no getting away from the sorry fact (for Dorling Kindersley) that out there in the shadows lurks a title which is every bit *World Atlas*' equal and a little bit more. *Encarta World Atlas* from Microsoft is a giant of a disc and possesses many more map styles and, more importantly, places names than its rival. On the other hand, the Dorling Kindersley disc is certainly a more accessible offering, and this makes it far more appropriate for the family. If you need to purchase a multimedia atlas, and we think you do, then the *Eyewitness World Atlas* is amongst the best ones on this planet.

Developer: Dorling Kindersley Contact: 0171 836 5411  
Publisher: Dorling Kindersley Price: £34.99

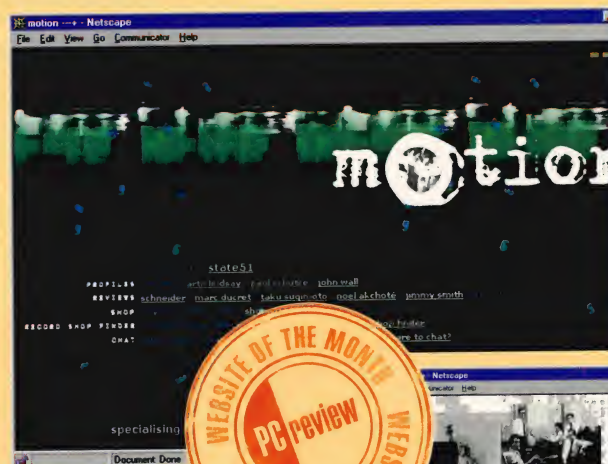
Recommended system: Pentium75, 16MB RAM, quad speed CD drive, Windows 95

For: A very stylish and easily accessible interactive book of maps

Against: Three little words: *Encarta World Atlas*

eight out of ten

## Web site of the month



left: Motion offers you a chunk of art that steers you proudly away from the mainstream.

below: Who needs Dire Straits when you've got Arto Lindsay?

### MOTION

<http://www.state51.co.uk/motion/>

Forget the mainstream for a moment, please. Open your mind. Bin your Bryan Adams and burn your John Grisham. Life's simply too short. There are alternatives. Seek them out.

Motion is a recently launched Web Site that dares to be different. Primarily concerned with music and a dash of literature, it realises there's creative life outside of the best seller lists and is not afraid to let people know about it. This is a wilfully eclectic site, as the banner so eloquently puts it, "specialising in hardcore-Brit-post-lofi-dark-industrial-prog-west-peace-bass-music." Left of left of centre artists are profiled and reviewed.

If your cultural fancy is tickled then Motion is developing an on-line shop to take your orders. This will take the pressure off your local Woolworth's who are unlikely to have the limited print-run Bukowski you're after, let alone the debut album by The Custard Necklace. To complete Motion's very commendable stab at posing as a cultural services provider, there's a chat room. But remember that talking about music is like dancing to architecture. With care this site will grow to the size of the heads of the mainstream stars it chooses to ignore.



# BROWSER: NEW RELEASES REVIEWED

True to form, the Net and CD-ROMs serve up yet another weird and wonderful brew. BY GARY TIPP

right: *Old Bill* is something of a critic's favourite. To slate him would be sacrilege.

below: So that's why it's called the Scottish play.



### MACBETH

CD-ROM £19.99 Cromwell Productions 01789 415187

"Is that a CD-ROM which I see before me?" It most certainly is. The developers, Cromwell Productions (of Stratford-upon-Avon), have taken the kitchen-sink approach to the Scottish play and come up with the ultimate companion for drama students and serious bard lovers alike. Possibly performed as early as 1606,

### Literary criticism

- literary criticism of shakespeare's tragedies  
this section provides examples of classic shakespearean criticism, and gives introductions to the major schools of literary theory.
- macbeth criticism  
this section contains video interviews with stanley wells (director of the shakespeare institute) and robert smallwood (head of education at the shakespeare centre) as well as the complete texts of, a.c. neale's famous analyses of macbeth.
- the internet index
- bibliography

the play was first printed in the edition of Shakespeare's works that was published in 1623 and is known as the First Folio. This version, together with a modern spelling edition with full glossary, appears here in its entirety. It is accompanied by a huge (but easily digestible) slice of literary criticism together with historical surveys of Shakespeare on stage, television and film. Indeed, the Key Scenes section contains video footage of

memorable passages taken from a recent movie adaptation. The clips fittingly include one of Scotland's favourite son's sons - namely Jason Connery. Despite good intentions and solid content, this disc is not a classic adaptation and will only be of any real use to the PC literate scholar who's gone and misplaced his pass notes. Don't break a leg trying to obtain a copy.

six out of ten

### MYTHS AND MONSTERS

[http://www.virgin.net/myths\\_monsters/](http://www.virgin.net/myths_monsters/)

If in the dank, dingy caverns of some seedy underground nightclub you start talking with a fire-

breathing female monster with a lion's head, a goat's body and a serpent's tail, you'd be best advised not to exchange phone numbers. You've been chatting up a chimera, a mythical monster and one of many put under the spotlight in the pages of a new Web site promoting a summer exhibition at the Natural History Museum. Myths and Monsters is the name of both the site and the exhibition and as you may have suspected focus on all sorts of mythical beasts, from creatures of the deep to aliens and many double-headed odd-looking curios inbetween. The site has



above: Sailors live in fear of the giant squid. It's obvious why.

fun in looking at the myths and then ruins it by examining the facts. Overall, the site could do with a lot more depth and pictorial evidence, but there's no getting away from the fact it whets the appetite for more. And, hey, that's where the Natural History Museum comes in.

seven out of ten continued over



## NILE

CD ROM £34.99 Zablac Entertainment 01626 332233

Falling between two stools is usually not a very good thing to do, especially if you work on a sewage farm. Yet this part-reference, part-game title makes a very acceptable exception to the rule. A joint production from heavyweight developers Simon & Schuster Interactive and The Metropolitan Museum of Art, *Nile* includes many not so subtle touches which would leave many a hardcore PC gamer chewing his bedroom carpet. All things considered this naive doesn't seem matter, as this adventure journey through Ancient Egyptian culture is so alluring as to divert any minor criticisms. Through the recounting of 15 illustrated myths, historical life on the banks of the world's second largest river is brought alive by actress Kelly McGillis and legendary synth-twiddler, Brian Eno. On top of discovering the culture and exploring the 3D environments, you are set a mass of fiendish puzzles. These include building your own pyramid to spearing a fish from an ancient yacht. Not things you do everyday. Oh, those Egyptians.

seven out of ten

right: One of the mythical creatures you'll meet on your journey down the Nile.



below: Ancient Egypt had its share of graffiti.



above: R and A. They're Royal and they're Ancient.

## THE ROYAL & ANCIENT GOLF CLUB OF ST ANDREWS

<http://www.randa.org/>

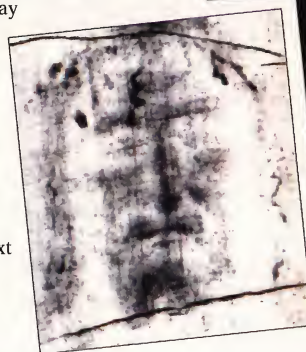
"Golf is a game in which a ball is struck with a club from a prepared area, known as the 'teeing ground', across fairway and rough to a second prepared area, which has a hole in it, known as the 'putting green!'" So now you know and not only that but you got it straight from the horse's mouth – namely the R&A. In 1897, the R&A became the Governing Authority on the Rules of Golf and just over a hundred years later these rules are painstakingly available, in their entirety, on this straight-down-the-middle Web site. There's precious little character attached and no warmth in the slightest, but if you want to know what to do when faced with Ground Under Repair or, heaven forbid, Loose Impediments then you've come to the right place. This is also the case if you're after ticket for the 1998 Open Championship, held at Royal Birkdale in July, as there is an on-line booking service. Overall, the site is as solid, reliable and humourless as cuddly Colin Montgomerie, if you think that's a good thing then pay a visit.

six out of ten

## NORTHERN EUROPE

CD-ROM £49.95 Software Partners 01480 466111

Apart from asking you how you like it cut, why is it that hairdressers are only ever capable of asking you one other question? "Are you going away on your holidays this year?" Could it be their geographical knowledge is so poor they need to ask complete strangers for ideas. If so, *Northern Europe* from Canadian developer PlanetWare could be just the ticket for your friendly barber. As this standard sized shiny platter is ostensibly a travel guide in disc form. Covering a dozen countries, it draws its inspiration and text from the renowned Baedeker books. Despite a large collection of good to average photographs, the disc is not a



above: Holy miracle and tourist attraction, the Turin Shroud possesses an excellent Web site.

thing of beauty and the interface is easy to use but ugly. Where it does score points, however, is with the large number of search options and the amount of information contained. You can identify places to visit by using maps and keywords or by checking out any one of 140 special interest categories. These include 'Wine, beer, spirits festival', 'Architecture: Rococo' and 'Scuba or snorkel opportunity', depending on your persuasion you are simply bound to find something to occupy the mind. Also with the same price point and for those who prefer their climes sunnier, a companion disc called *Mediterranean* is also available.

seven out of ten

## THE TURIN SHROUD

<http://sindone.torino.chiesacattolica.it/>

Holy linen! It's only a flax sheet, woven in twill-and-herringbone, 436 centimetres long and 110 centimetres wide. So what's all the fuss about then? Well, that ordinary enough sounding piece of material just happens to possess the spitting image of our Lord Jesus subtly emblazoned on it. The Turin Shroud has recently been shown off to the public – fittingly enough in Turin – for the first time in over 20 years and the native Catholic public have proved themselves to be mad for it. Accordingly the official site has been impressively updated to catch the latest wave of Shroud fever. These reverential pages look analytically at this significant sliver of cloth in three different ways: the Biblical route searches for appropriate references in the Holy scriptures; the Scientific route basically states that modern experts are still a tad flummoxed; while the Iconographic route attempts to apply an historical context. Turin



## Plugged In: Media Player

Our monthly guide to essential, fun and downloadable add-ons for your Web browser

**Who makes Media Player?**  
Microsoft

**What does it do?**  
Plays different types of audio and video from your hard disk or the Internet. This means it can read common formats like WAV sounds, QuickTime and AVI videos as well as RealVideo and NetShow ASF.

**How does it work?**  
*Media Player* is a new version of the application bundled with Windows and works in exactly the same way to play sound and video saved on your PC. However, this latest version also incorporates *NetShow*, which plays files streamed over the

Internet. Streaming prevents you from having to download a video before playing it. The video plays live as it downloads from the Internet, and isn't saved onto your hard disk.

**Can I live without it?**  
*Media Player*, and its predecessor *NetShow*, has always been a poor relation to RealNetworks' *RealPlayer* for Internet audio and video.

**Where can I get it?**  
It's a 4MB download from <http://www.microsoft.com/ntserver/netshow/> and, of course, from the CD Review disc.

**Top Media Player sites**  
1 Warner Bros Hip Clips  
[www.hipclips.com/](http://www.hipclips.com/)  
Videos and clips from US TV shows.  
2 ITV.net  
[www.itv.net/ondemand/risk/](http://www.itv.net/ondemand/risk/)  
Rock concerts, film festivals and live Webcasts.  
3 Seinfeld.com  
[www.seinfeld.com/](http://www.seinfeld.com/)  
Seinfeld pulled the plug on his TV show, but the memories survive.  
4 Mount Everest  
[everest.mountainzone.com/98](http://everest.mountainzone.com/98)  
Video dispatches from a trek up Mount Everest.



above: NetShow plays video without the need to download.



left: The number of sites using it is increasing.





above: The excellent *Solar System Explorer*: the title, for once, says it all. First stop, the Red Planet.

may be an awful long way to go just to gawp at a glorified tea towel, but point your browser at this fascinating site and you may be tempted to stay awhile. In the words of the saintly Father Jack, "It's an ecumenical matter."

eight out of ten

### SOLAR SYSTEM EXPLORER

CD-ROM £9.99 Focus Multimedia 01889 570156

David Bowie asked way back in the early 70s about the possibility of it but several missions later and there's still no proof that life exists on Mars. Despite this obvious upset and the lack of any extra-terrestrial encounters whatsoever, *Solar System Explorer* from budget barons Focus Multimedia is well worth a quick dip into the pocket containing your wallet. For a penny under the ten quid mark you can accurately mirror interplanetary flight. Yep, *Solar System Explorer* is a space sim and a very capable one at that. Based on the latest orbital theory developed for the now very defunct Russian Space Programme, the title can help you navigate further up your Uranus than you may have thought possible. Being able to plot a course from Earth to the outer rocks from the Sun is a remarkable achievement which *Solar System Explorer* offers up on a plate. But hold on to your after-burners there's more, and this takes the shape of interactive debriefing on past space missions. Developed by the makers of the *RedShift* series, this is truly a budget disc to be taken seriously.

eight out of ten

### DIGITAL FREEDOM NETWORK

<http://www.dfn.org/index.html>

You'd think that any site run out of Hackensack, New Jersey by a guy called Bobson Wong is going to be a



above: The Army has got big guns and...



left ...some strange ideas about make-up.

## Cinema site of the month

### GODZILLA

<http://www.godzilla.uk.com>

With no less than three downloadable trailers on *Godzilla*'s suitably swanky and immense Web site, this forthcoming summer blockbuster already fair reeks of hype. Following in the not entirely unsuccessful treadmarks of *Independence Day*, the Hollywood pre-release publicists are working overtime to turn *Godzilla* into the huge cash-lizard everybody expects it to be. The Web site bears testament to this and, without (thankfully) giving away too many of the movie's secrets, is as polished and comprehensive as one of these gets. Trailers aside, there's up-to-the-minute cast news and production notes, together with a screensaver and as many merchandising opportunities as you could shake an electric cattle-prod at.

You can also count yourself lucky to cop an exclusive ear-gander of the roar of the seemingly constipated *Godzilla*. Best of all, there's a little virtual pet to feed, you guessed it, the Tamagodzi. Rumour has it the movie may be delayed in order to miss avoided divided loyalties caused by the World Cup, but there's no doubting that by the end of the summer, *Godzilla* will be over



above: The star of this monster site? No, actually. The real *Godzilla* is being kept under (large) wraps.

everybody like an unwelcome, multi-million dollar budget rash. You're going to get it, so why not catch it here first? There will be no escape.

dubious one, but this turns out to be far from the case with the Digital Freedom Network. The aim is to provide people around the world with free access to information that had previously been difficult or impossible to find, such as a letter from a Chinese dissident to his President and the clandestine work of a Cuban poet. An international nonpartisan partnership working with free speech and human rights organisations, the Digital Freedom Network publishes censored material on its Web site. By using the power of the Internet to circumvent restrictions on free speech, DFN applies pressure on authoritarian regimes that censor materials and violate human rights. Just how much influence or power this site actually has is eminently debatable but it's always reassuring to re-discover the Web is not simply a refuge for cash-hungry commerce and flesh-fixed pubescents. An ultra-worthy and, at times, quite distressing slice of virtual free speech.

seven out of ten

### THE BRITISH ARMY

<http://www.Army.mod.uk/>

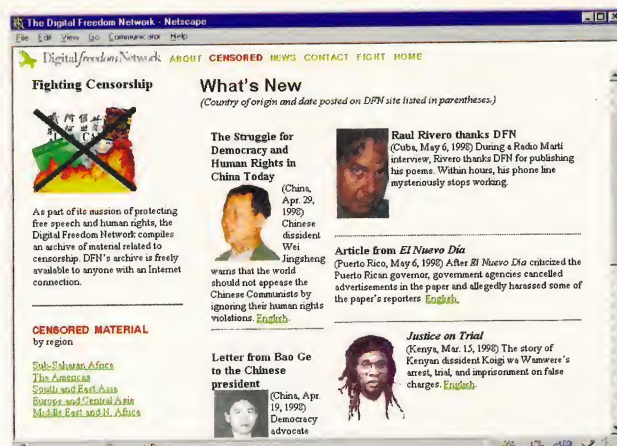
Fans of *Quake II*'s vast array of weaponry should go take themselves a look at the relaunched new-look British Army site. You may have thought the rocket launcher and rail gun made a pretty phenomenal arsenal but they are reduced to piddling peashooter status when compared to the mighty Milan Portable Anti-Tank Guided Weapon. Now it's a tad puerile to judge a British Army site solely on the impressive size of its guns, not only for the obvious reasons but also because there's a great deal of interesting info contained on its Web pages. Since its launch in July 1996 it is estimated that over 80 officers have been recruited directly through the site and the relaunch has taken things one step further. It not only holds the usual mass of facts and stats but has taken the step of acting as an Intranet on the Internet for Army members, friends and family. In a bizarre turn up for the book, the site is also now taking advertising space on-line. So if you think you have a product worth placing, this could be the opportunity you've been looking for.

eight out of ten

### TASTE OF JAPAN

CD-ROM £19.99 Europress 01625 855000

While plenty of war-time veterans with a long



above: The Digital Freedom Network is the Net at its most worthy and a fascinating insight into political liberties in other countries.

memory would gladly give the Japanese a taste of something completely different, this culinary concoction from Europress boldly aims to illustrate the beauty of Japan through the art of sushi. This is a good trick if you can pull it off and *Taste of Japan* all but manages to pull it off. Indeed, this disc is a strange title in many ways and mixes in-depth video demonstrations of sushi preparation with the not so noble art of paper-folding. And to all intents it works. It certainly helps a lot that the production values on this disc are high and sound, graphics and photography are all of an excellent standard. There's also no small amount of insight into the pursuit of slapping a bit of raw fish onto a plate. For instance, did you know that although arranging nigiri zushi may seem simple, considerable

continued over

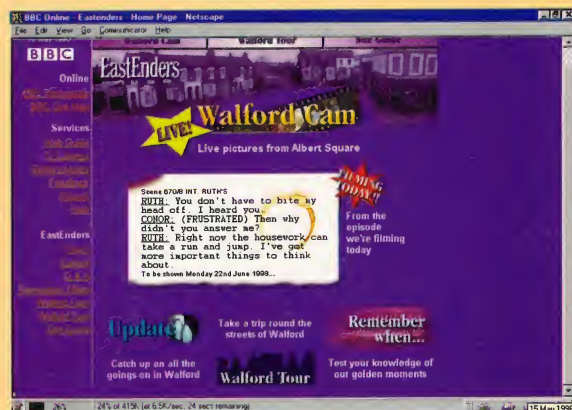


above: It may be nicely presented and have a fancy name, but it's still only raw fish and white rice.



## Net wars: Coronation Street versus EastEnders

The Net is becoming a virtual battleground for some real world rivalries



left: The Walford Web site is neither drab or gloomy. Something is seriously wrong here.

As the old saying goes, one man's poison is another man's veggieburger. Throughout the course of popular history high profile adversaries have often taken centre stage. From Napoleon and Wellington to Blur and Oasis, the public imagination has been frequently fired up by competitive feuding. The Net offers a platform for this type of consternation to flourish and PC Review is only too happy to furnish details of them. This month:

**Coronation Street vs EastEnders**  
His mother Ida was knocked down by a bus, his father Frank died of a stroke, his brother David was killed

in a car crash, his first wife Valerie died in a house fire and his second wife Janet committed suicide. We're talking about Corrie's long-suffering Ken Barlow and, as if you weren't aware, such are the perils of being related to a soap opera star. If you don't feel a little queasy about sticking your nose into other people's suffering then you might want to point your browser at Granada TV's official site for the long running grimupnorthathon that is *Coronation Street* (<http://www.coronationstreet.co.uk/>). An excellent site there's not only the chance to catch up with what is happening now but The Story So

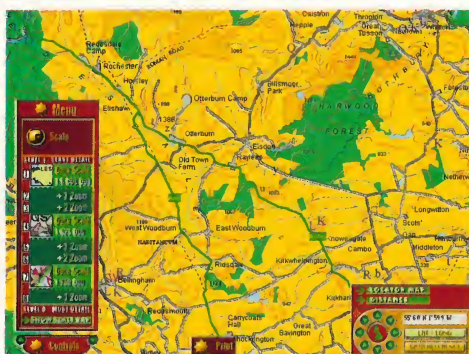
Far pages remind the nostalgic of all the significant plotlines going back to 1960. There's also profiles on all the characters together with some virtual postcards ripe for the sending. Although a link to the Hang Deirdre Rachid Campaign ([http://www.geocities.com/~madmanonline/deirdre\\_rachid/](http://www.geocities.com/~madmanonline/deirdre_rachid/)) is missing, this is a very pleasing way to spend some time until the kettle boils.

Considering the weekly soap's grubby location and often depressing ambience, the EastEnders site (<http://www.bbc.co.uk/eastenders>) is a surprisingly colourful and sparky affair. It's similar in many ways to the

*Coronation Street* site and possesses a few more gimmicky devices, such as the Walford Cam. Taking exclusive pictures from the set, the avid 'stenders' fan has the ability to look into the future. Despite a swish tour of the Square and some classic video clips (including a little gem called 'Pauline, Arthur and the Frying Pan' - ouch!), the site lacks the volume of information which made the Granada site a more than worthwhile visit. A good close call but the whinging northerners just steal it from the moaning Southerners. This month's winner is *Coronation Street*.



left: It may be grim up North, but the Street's site gets the upper hand over those grumpy cockneys.



above: Locate youth hostels, churches, wooded areas and, most importantly, pubs with the OS Atlas.

thought goes into the way in which the different textures are complemented? Learn this and a whole more with *Taste of Japan*.

seven out of ten

### ORDNANCE SURVEY INTERACTIVE ATLAS CD-ROM 39.99 Attica Interactive 01865 791346

This *Ordnance Survey Atlas* is an interactive general reference atlas of Great Britain, and is intended not only for the lap-top owning jolly rambler but for family and educational use to boot. It offers a wide range of mapping detail with full coverage of Great Britain at 1:250,000 scale (the printed equivalent of which is 1 cm to 2.5 km) plus extracts at 1:50,000, 1:25,000 and 1:10,000. This is the second incarnation of the *Ordnance Survey Atlas* and it's much improved. New to the scheme of things are 45 city centre plans, a Locator map and distance measuring. The second edition also runs a heck of a lot quicker and for the casual map browser it offers a lot more mental stimulation than a printed map. The inclusion of statistical 'information maps' of Great Britain, European Union facts and figures, a map skills sections and an Around Britain Quiz certainly are crowd pleasers. On top of all this, you could even use it to plot out where you were going. Obviously, this

title lacks the panoramic scope and statistical might of Dorling Kindersley's *Eyewitness World Atlas*. Yet if you were lost in the Forest of Dean at night with just a laptop and this disc, you'd soon be singing its praises from the treetops.

seven out of ten

### ALIEN ALLEY

<http://www.alienalley.com/index.html>

In a recent interview, no less an authority than Paul Gascoigne told a gobsmacked press that UFOs really did exist. Gazza claims he is convinced extraterrestrial life is out there somewhere, but confirmed he hasn't yet bumped into any in person. When and if the erstwhile footballing genius does bump into one of these funny looking critters, he could do worse than roughly sketch out a likeness and submit it to the Web site that goes by the name of Alien Alley. Originally a commercial concern, the site has been recently relaunched and now takes its place on this God's earth as an on-line gallery for those who wish to put

right: Welcome to Alien Alley. Spooky and fun, but is it art?



their experience down on paper. The quality is diverse. Ranging from the expert artist to the spooked 'can't draw for toffee' individual, this alien body of work makes for one strange gallery. A bit bonkers and not exactly art in its highest form, Alien Alley is well worth a visitation.

eight out of ten

## The Main Event: The World Cup Café

<http://worldcupcafe.com>

Save for hiring an isolation tank for a month, you are not going to be able to avoid it. So don't even try. Let's face it, there are many far bitterer pills to swallow than being subjected to a month long diet of world class international football. Okay, so the French weren't particularly forthcoming when it came to ticket allocation, but this excellent site almost (but not quite) makes up for the



above: Keep on the ball with World Cup Café.

disappointment. It's a free, easy and very relaxed site which creates a pleasing ambience all of its own. Yet its comprehensiveness is not to be underestimated and there are over 12,000 pages of information conveniently on hand. Being almost three times more than any of its rivals for your football-shaped heart, there's no doubting its credentials. There's also a gamesroom, radio station and database covering more than 500 World Cup players. When the first ball is kicked in anger, the site jumps into phase two of its action plan and live goal-by-goal coverage is some compensation for not being sat in front of a television set with a can of chilled lager in your hand. What price Scotland?





# ESSENTIAL SITES: TRAVEL

Who said there ain't no cure for the summertime blues? Plan yourself a holiday. **BY GARY TIPP**



above: The top travel location: the Lonely Planet On-Line site is far from being a pile of junk.

## LONELY PLANET ON-LINE

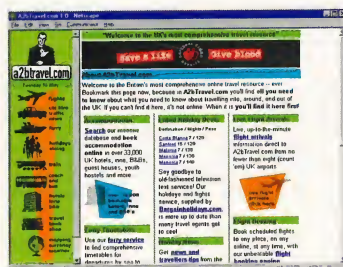
<http://www.lonelyplanet.com>

**1** The self-advertising tagline claims this site to be both 'down-to-earth' and 'out-of-this-world.' It's not far off. Lonely Planet On-line is the Web's premier stop off points for sun worshippers, culture vultures and thrill seekers alike. A wonderful resource which will make you itch for your passport and phrase book, there are enough holiday destinations covered here to fill a giant's rucksack. The scam is that this site whets your wanderlustbuds, you book a holiday and then, hey, what better guide book to purchase than a volume from those nice people at Lonely Planet. With some suitably sassy writing, dynamic photography and no small amount of wit, the only thing stopping you visiting faraway shores is the need to peruse this singularly superb site.

## A2BTRAVEL.COM

<http://www.a2btravel.com/>

**2** Forget the knotted handkerchief and rolled up trouser look of yesteryear, the Brits are as on the ball as the next man when it comes to holiday. Helping them rack up the air miles is the UK's most comprehensive travel resource, A2BTravel.Com. While lacking the funky feel of the Lonely Planet site, A2B is still an essential bookmark for the willing tourist. The amount of practical advice is as mountainous as the Himalayas. What's more there's always live, up-to-the-minute flight arrival information direct to A2BTravel.com from no fewer than eight (count 'em) UK airports. And who needs a travel agent when you can use its powerful price comparison and availability checker to book hotels almost anywhere in the world? It's enough to make Judith Chalmers turn in her grave. If she was dead, that is.



above: A2BTravel will sort you out.

## BARGAINHOLIDAYS.COM

<http://www.bargainholidays.com/>

**3** It doesn't take a fancy education and/or a large brain to work out what Bargainholidays.com is all about. Crazy prices but hopefully not crazy pilots. You can use Bargainholidays.com to search the UK's biggest database of over 70,000 late-availability holiday sun, city break and holiday flight deals from all of the UK's top tour operators. Specialising in cut-price jaunts to the Balearic and Greek islands, this potentially wonderful site also offers you the chance to book your break through them without any credit card surcharges, or compulsory insurance. You may not find 14 nights in Fuerteventura for under a fiver but keep looking long enough and you're likely to save a whole bundle in potential travellers cheques. The more money you save, the more you can spend.



## TAKE OFF

<http://www.takeoff.beeb.com/>

**4** Part of the ever wonderful and seemingly ever expanding Beeb site, Take Off! Is much more than a virtual Holiday Show. Yes, there is an article featuring Toyah Wilcox's adventures with a camel but there's a lot more besides. The Holiday Hunter offers a choice of destinations to rival the number of stamps in Michael Palin's passport, while the Lowdown picks on a site and gives it a thorough going over. We must say that Belize looks particularly nice this time of year. Add a weekly Web cam (currently Karachi), where to stay in Japan on a limited budget plus a good choice of virtual postcards to whizz off to friends, and it becomes apparent Take Off! is a mixed bag of exotic tricks. Pay a visit!



left: Mickey welcomes you to the Disneyland gift shop with open paws.

## DISNEYLAND

<http://www.disney.com/Disneyland/index.html>

**5** There was a time when it was the dream of every young child under the age of 30 to visit Disneyland. Times have changed and the joint charms of the Spice Girls and the PlayStation have proven to be distracting, yet Disneyland still possesses the stuff that dreams are made of. With the miracle of the Net you can now save on air fares and let your loved ones visit from the comfort of your safe European home. Mickey and his mates are always on hand to guide you on a virtual tour and they're dead keen to let you plan your intended visit. Not surprisingly for Disney there's also a gift shop stuffed to the virtual gills with product.

## GOA INTERACTIVE

<http://www.goa-interactive.com/>

**6** Billed as "a truly Goan experience on the World Wide Web", Goa Interactive paints a pretty picture with tales of sun, sea, sand and surf. And the intrepid traveller will be have his or her mouth watered further if he dares venture any deeper into this excellent site. This is tourist information at its most provocative and browsing becomes almost intolerable, as the desire to book a flight becomes so great. Visit this site and you may never come back.

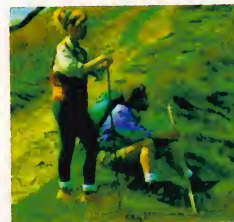


above: What is the appeal of 18-30?

## CLUB 18-30

<http://www.club18-30.co.uk>

**7** A far cry from Disneyland, Club 18-30 holidays are usually lager-soaked, testosterone-caked affairs with sun, sea and sex casually on the agenda. The Web site is surprisingly reserved and the temptation to get all laddish has been for the most part resisted. This is not to say it is totally without blame and it would have been a real shame any other way. The site's also commendable for its furiously funky design. It's one hell of a trip and if at the end of it you find a brochure landing on your doormat then all well and good. Let's face it, Corfu, Rhodes, or Turkey are as good a place as any to suffer from a hangover and sunstroke at the same time.



left: These boots were made for walking and that's just what they'll do.

## THE BRITISH TOURIST AUTHORITY

<http://www.visitbritain.com/>

**8** If, like the big Dutch blouse Denis Bergkamp, you are afraid of setting foot in an airplane then this green and pleasant land is one of the options left open to you. If you also have a fear of boating on canals then you're really in trouble, but the British Tourist Authority may still have something for you. The site is an unseasonably bright and breezy affair which welcomes you to zoom into its interactive map to find accommodation, places to visit, events, or tourist information centres. What it lacks in duty free opportunities it makes up for in pages about cycling, walking and camping.



## WANDERLUST

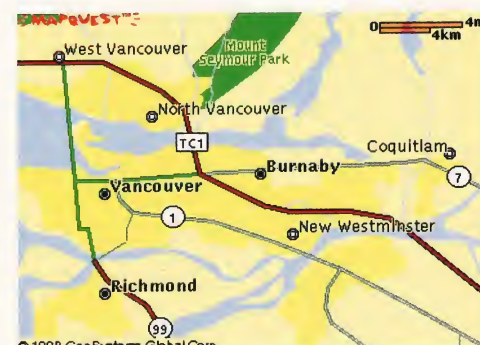
<http://www.salonmag.com/wlust/>

**9** Part of the rather excellent Salon site, Wanderlust is a courageous attempt at breathing life into the noble genre of travel writing. From the wonderful Paul Theroux to the ubiquitous Bill 'bloody' Bryson, Wanderlust cares passionately about the genre. As you'd expect the features are wordy and the visual are scarce, but if you find yourself inbetween journeys then this sure is the place to rest awhile. Intelligent, fascinating and downright weird, Wanderlust will quench your thirst.

## MAPQUEST

<http://www.mapquest.com>

**10** MapQuest is the most popular interactive mapping service on the Net. Both Java- and ActiveX-enabled, it kindly offers you the ability to interactively zoom and browse your way to over three million locations worldwide on an interactive atlas, obtain city-to-city and door-to-door driving directions, identify places of interest, and create personalised maps. Despite a slight American bias, the site offers the most detailed, high-quality cartographic info available online with attractive, readable maps. So if you know where you're going but you don't know how to get there, then you now know where to go. Okay?



above: All mapped out? Then try out MapQuest.

## Coming soon!

We once again try and tap into the Net's worthy side and, next month, seek out the premier sources for Literature. Read it and weep!



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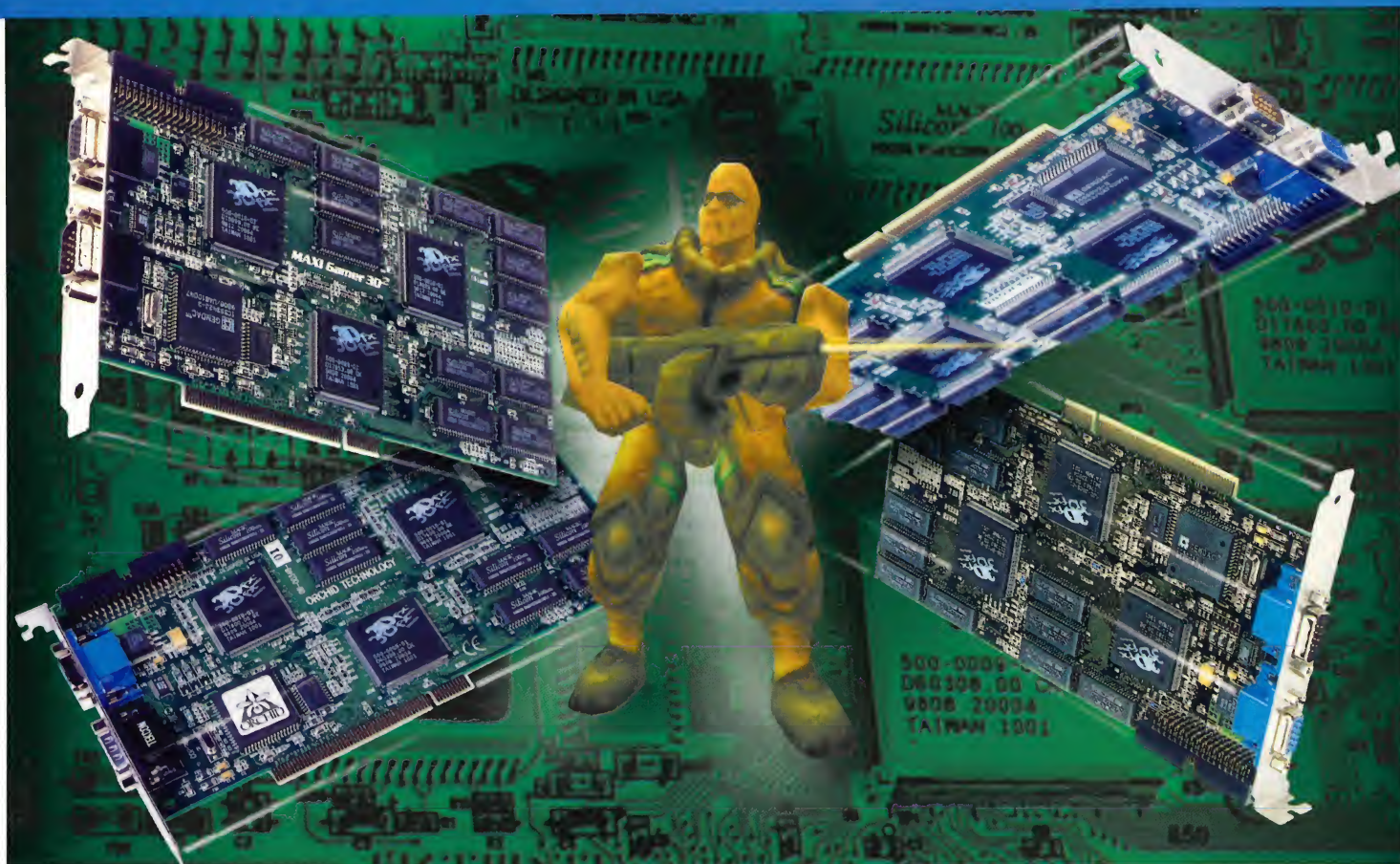


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## Voodoo2 deathmatch

What exactly is Voodoo2 all about, and **which card should you buy?** BY GARRICK WEBSTER

**V**oodoo is a kind of magic to West Indian mystics and PC gamers alike. To the former, it's a force that involves ritual chicken killing, dolls riddled with pins, zombies who rise from the grave and heaps of superstition. For PC owners like us, however, Voodoo is a high tech solution for 3D graphics that's based on a combination of silicon engineering and mathematical genius. It's right out on the leading edge of entertainment technology.

Despite the evident level of sophistication, you'd be forgiven for thinking that Silicon Valley's 3Dfx, inventor of Voodoo Graphics, is exerting some kind of supernatural force over us. Around the world there exists what could almost be described as a cult of gamers, who swear by 3Dfx accelerated games and nothing else. The power of the Voodoo trance is amazing, and now 3Dfx has released an upgraded version of the Voodoo chipset – Voodoo2 – which is likely to enchant an even larger number of PC gamers this summer.

Here at PC Review we've got the first four Voodoo2-based 3D boards to hit the market including 3D Blaster Voodoo2 by Creative Labs, Righteous 3D II from Orchid Microelectronics, Diamond's Monster 3D II, and the Maxi Gamer 3D2 by Guillemot. Not only have we tested these four boards in hardcore gaming conditions, but we've also endeavoured to clear up some of the confusion

surrounding 3Dfx cards and advise you on whether you really need one or not.

To take advantage of Voodoo2 you'll need a free PCI slot and a 2D card. All 3Dfx cards are dedicated 3D accelerators which, once installed, take over most of the 3D work required by games as long as they're written using either the 3Dfx Glide programming language, or for Microsoft's Direct3D standard. The board slots in beside your existing graphics card and connects to it via an external flylead around the back of your PC. Now all you need to do is install some drivers and get yourself some compatible games.

Nearly all the big sports, action and flight sim games these days have 3Dfx support in their programming. This means their quality is improved by either the original Voodoo or Voodoo2 chipset. Titles such as *Quake2*, *Forsaken*, *World Cup 98*, *F197*, *Battlezone*, *Ultimate Race Pro*, *Incoming* and *F22 ADF* are all optimised to utilise the extra power on offer. Voodoo Graphics not only makes higher screen resolutions possible for greater levels of detail – like 800x600 for *Quake2* – but it supports all sorts of special effects including coloured lighting, fogging and texture blending.

Most important, though, is the way 3Dfx cards speed up games. Because they can generate 3D scenes faster than normal graphics

### WRITE IN TO WIN!

Don't fancy spending £200 on a Voodoo2 board? Why not turn to our letters page (22), which is sponsored by Maxi. If yours is the best letter we print next issue you'll be awarded your own Maxi Gamer 3D2.

*continued over*



right: *Unreal* may be the next big game to test your 3Dfx card's powers. Read our review next issue.

## THE ORIGINAL Voodoo

If you have a slower machine you can still get a 3D speed burst from one of the first generation of 3Dfx cards. You can pick one up for under £100. A good bet is the Maxi Gamer 3D which is available in a wide range of shops. You can overclock the card, for that extra bit of juice, by reading our guide to speeding up your 3Dfx card in the June issue of PC Review (PCR82). It's available through our Backissues line on page 95.

## TEST YOUR OWN

To test your own PC's framerate performance, get hold of our last issue (see Backissues on page 95) and install the *Quake 2* demo from CD Review. Pull down the console by pressing the top left key on the keyboard (beneath [Esc]), type in TIMEDemo 1 and hit [Enter]. Then type MAP DEMO1.DM2 and press [Enter]. The game will run a demo sequence and deliver a framerate at the end. Alternatively, go to any point in the game and type TIMEREFSH. Again you'll get a framerate for that scene.



cards, your games can be played with higher frame rates. Whereas *FIFA 98* might struggle along at frame rates between 15 and 20 frames per second without acceleration, with a 3Dfx card you can bump that rate up above 30fps. Less jerkiness in the gameplay makes it more interactive and you can see more of what's going on and react faster.

## Voodoo and Voodoo2

Original 3Dfx cards like the Monster 3D and Righteous 3D have one pixel processor, a texel processor for handling all the texture information and 4MB of DRAM shared between the two chips for storing data. Textures are the graphical patterns that fill the polygons making up a 3D scene. Characters' heads will have individual facial textures, while architecture might use repeated brick patterns to make it look solid. As 3D games get more complex the scenes they create use an increasing number of textures and atmospheric effects, and this requires more 3D processing power.

Voodoo2 provides that power. A Voodoo2 card comes with a faster pixel processor, two texel processors and either 8MB or 12MB of onboard RAM. Of the four cards tested here, only the Monster 3D II had 8MB. The rest all had 12MB. With the pixel processor generating scenes pixel by pixel at a very high rate, assisted by two texture units to handle all the texture data, Voodoo2 cards are twice as powerful as their predecessors, and cost about twice as much.

## Voodoo2 and your processor

Before you rush out and buy a Voodoo2 card, a number of points are worth consideration. How fast is your processor? Although the minimum system requirement for a Voodoo2 card is a 90MHz Pentium, in reality any Pentium slower than 233MHz will not be able to take full advantage of the power of this chipset. The performance gain of Voodoo2 over original Voodoo is smaller the slower your machine. In essence, you'll be paying an extra £100 above the cost of a first generation 3Dfx card for extra power your machine won't be able to use. If you've got a P166 or less, we'd probably advise you to buy an original Voodoo card like the Monster 3D, Righteous 3D or Maxi Gamer 3D.

How is this so? Well, if your processor's pumping data to your 3D card at a slower rate, your card will have less to do. The board is therefore sitting there processing all the polygons it's sent, with power to spare. The processor is the bottleneck. PentiumII chips send polygon information (polygons are what programmers use to build 3D scenes) at higher rates and the Voodoo2 chipset can pick up the slack, successfully creating complete 3D scenes at very high

framerates. On a PentiumII processor from 233MHz up, the Voodoo2 chipset really comes into its own. If you own such a machine the £100 extra you pay for a Voodoo2 card will be more worthwhile as the performance gap above and beyond original 3Dfx cards is that much wider.

## Play your cards right

Voodoo2 cards are significantly more powerful than today's games require. Also, there are no games on the market that use Voodoo2 to do things that original 3Dfx cards can't do. At the moment Voodoo2 offers extra speed and power but nothing else. Whereas *Quake 2* may run at 24fps at 640x480 on an unaccelerated 400MHz PII, with a Voodoo2 card you'll be able to play it at 80fps. Beyond 45fps your eye won't notice the difference, so that's far faster than you'll ever need to play *Quake 2*. But by the end of the year, game detail will have advanced beyond that of *Quake 2* and Voodoo2 cards will have the overhead to deal with the extra demands.

Later this summer, however, a range of new 3D chips will be available that utilise the advanced graphics port found in all new PentiumII machines. These will be better than current AGP cards and a number of graphics chip makers are already saying that their solutions will rival the speed of Voodoo2. Companies like VideoLogic, Intel, S3 and Matrox are also claiming that their chips will support all the special effects like coloured lighting and bump mapping which Voodoo2 offers. And the clincher is that these new AGP based solutions will not be 3D add-ons, they'll be full graphics chips with 2D, 3D and video (TV or MPEG) processing on all a

single card. The cards themselves will likely cost between £100 and £150, which is cheaper than Voodoo2 but with more functionality.

You can either upgrade to Voodoo2 now, or to wait until Autumn to see whether these AGP cards live up to the performance claims made by their manufacturers. We've seen S3's Savage 3D up and running, and can confirm that it delivers 3D quality that's at least equal to what Voodoo2 can offer. Cards with this chip on will only be available in September, tough. The Intel chip looks set to be impressive as well. Watch this space.

If you can't wait and you're mad for gaming action NOW, going for a Voodoo2 card makes sense. The chipset definitely has the power to see you into next year regardless of what the all-in-one chips turn out to be like. Like the new

chips, Voodoo2 will support Microsoft's DirectX6 3D sections, so even if programmers stop putting support for 3Dfx cards into their games, you'll still have a fast 3D accelerator which will improve games through DirectX3D.

## Which Voodoo2 card?

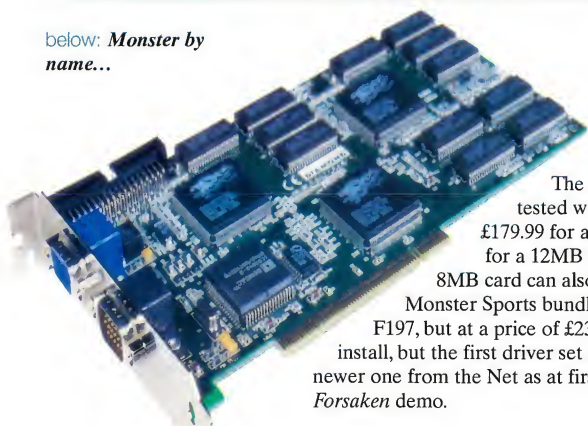
From a performance point of view it really doesn't matter which Voodoo2 card you decide to purchase. We tested all four thoroughly on our PII 400, as well as installing them on other sundry machines around the office ranging from a P166 to a PII 300. To give you some idea of our results, on the 400MHz machine *Quake2* framerates varied from 82.0fps to 82.8fps. That really is a tiny performance variance. In *Forsaken*, where we took the median framerate running the game's demo mode, the results stretched from 122fps to 130fps, a difference undetectable to the naked eye. All the cards work at the same screen resolution, so there are no advantages to be had there.

There will be no abdication of our responsibility to give you the best buying advice available, however, so read the reviews box included to see which card pleased us most. But do remember that because these Voodoo2 cards are actually all identical in construction you won't suffer if you go for one of the others. **PCR**



above: *Quake 2* is the quintessential 3D game at the moment, and it's the one we use to test graphics cards.

below: *Monster* by name...



The Diamond Monster 3D card we tested was an 8MB board. The card starts at £179.99 for an 8MB model, going up to £229.99 for a 12MB one. As a special retail offer, the 8MB card can also be found in the

Monster Sports bundle including World Cup 98 and F197, but at a price of £239.99. This card was the easiest to install, but the first driver set we had needed to be replaced by a newer one from the Net as at first try the card wouldn't run our *Forsaken* demo.

# Monster 3D II

Developer: 3Dfx  
Supplier: Diamond Multimedia  
Contact: 01189 444400  
Price: £179.99 (8MB) £229.99

Recommended system: P90, 8MB RAM, graphics card, free PCI slot, CD drive, Windows 95

For: A high performer from a reputable graphics card firm

Against: Slightly more expensive than the competition

eight out of ten





# 3D Blaster Voodoo2



PC Review tested a 12MB version of the Creative Labs card. Its performance was perfectly in line with that of all the other cards and there were no difficulties in getting the card installed and working. At £229 for a 12MB card and £179 for the 8MB one the 3D Blaster looks very tasty with a games bundle including *Ultimate Race Pro*, *Incoming*, *G-Police* and *Actua Soccer 2*. It's an extremely tough choice, but on the balance we feel the 3D Blaster Voodoo2 offers the best all round bundle.

left: 3D Blaster Voodoo2 just edged it.

Developer: 3Dfx

Supplier: Creative Labs

Contact: 01245 265265

Price: £179(8MB) £229 (12MB)

Recommended system: P90, 8MB RAM, SVGA graphics card, CD drive, free PCI slot, Windows 95

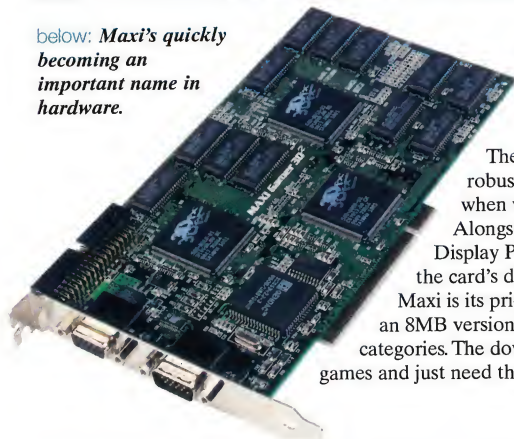
**For:** All that great performance with good games to boot

**Against:** Like the rest, may be overshadowed this Autumn

**nine out of ten**

below: Maxi's quickly becoming an important name in hardware.

## Maxi Gamer 3D2



The Maxi Gamer 3D2 proved to have the most robust drivers during our tests, with fewer crashes when we were trying its various features.

Alongside the Diamond, it also has the best Display Properties panel, from which you can adjust the card's different settings. The best thing about the Maxi is its price. At £199.99 for the 12MB and £169.99 for an 8MB version it's the cheapest on the market in both categories. The downside? No bundled games. If you've got the games and just need the hardware, this is the card to buy.

Developer: 3Dfx

Supplier: Guillemot/Ubisoft

Contact: 0181 944 9000

Price: £169.99(8MB) £199.99

Recommended system: P90, 8MB RAM, SVGA graphics card, CD drive, free PCI slot, Windows 95

**For:** Top notch 3D speed at a competitive price.

**Against:** There's no games bundle.

**eight out of ten**

below: Our editor uses one of these Righteous 3D IIs.

## Righteous 3D II



There is no 8MB version of the Righteous 3D II – it's 12MB or nothing at the moment. The card's as fine a performer as you could want and we had no difficulties with it whatsoever. The games bundle it comes with includes *Battlezone*, *Jedi*

*Knight (Ambush at Altyr 5)*, *Incoming* and *G-Police*. If you're not interested in the sports games included with other company's cards this might be the one to choose, but at £249 it's also the most expensive one we tested.

Developer: 3Dfx

Supplier: Orchid Micronics

Contact: 01256 479898

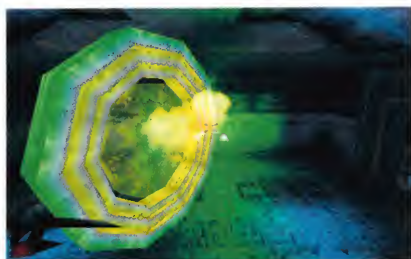
Price: £249 (12MB)

Recommended system: P90, 8MB RAM, SVGA graphics card, CD drive, free PCI slot, Windows 95

**For:** The excellent 3D acceleration you'd expect, some top games

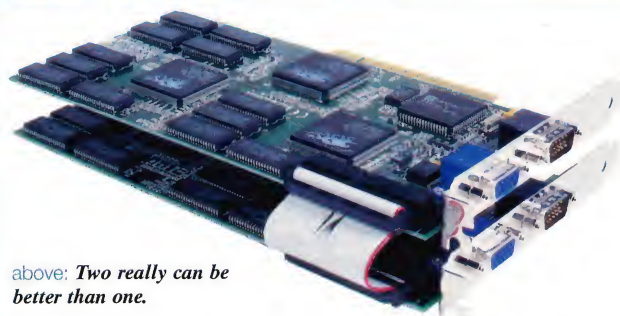
**Against:** The price is a touch high

**eight out of ten**



left: Forsaken's myriad of lighting and explosion features can cause framerate glitches even with Voodoo2.

## Double Diamond



above: Two really can be better than one.

Action game lovers who want total performance no matter what the cost might consider putting two Voodoo2-based boards in their machines. This is possible due to a neat feature built into the 3Dfx technology called Scan Line Interleaving (SLI). Under this method, the first Voodoo2 board will process data for odd numbered scan lines in the display, while the second will do even numbered lines. This essentially gives you twice the fill rate and twice the texture-handling capacity. We put two Diamond Monster 3D II cards into our PII 400 and the results were mindblowing. *Forsaken* hit framerates over 200fps, while *Quake 2* played at a cool 90 at 640x480, or 70fps at 1024x768. Too much...

## Making crucial comparisons

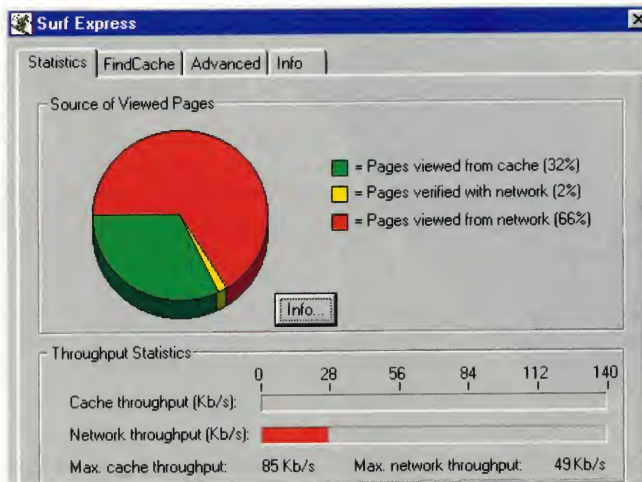
Card	Righteous 3D II	3D Blaster Voodoo2	Maxi Gamer 3D2	Monster 3D II	2x Monster 3D II
Onboard Memory	12MB	12MB	12MB	8MB	16MB
<i>Quake 2</i> @ 640x480	82.3fps	82.8fps	82.0fps	82.8fps	91.2fps
Max Resolution in <i>Quake 2</i>	800x600	800x600	800x600	800x600	1024x768
<i>Forsaken</i> @ 640x480	128fps	130fps	122fps	128fps	165fps
Price	£249	£229	£199.99	£179	£358

Note: The cards were installed on a PII 400MHz with 64MB RAM. Vsych was turned off so the games produced their own framerates rather than sticking to the monitor's refresh rate. Framerate for *Forsaken* is median framerate while running game demo.





above: *Surf Express automatically retrieves information from pages that have been updated since your last visit.*

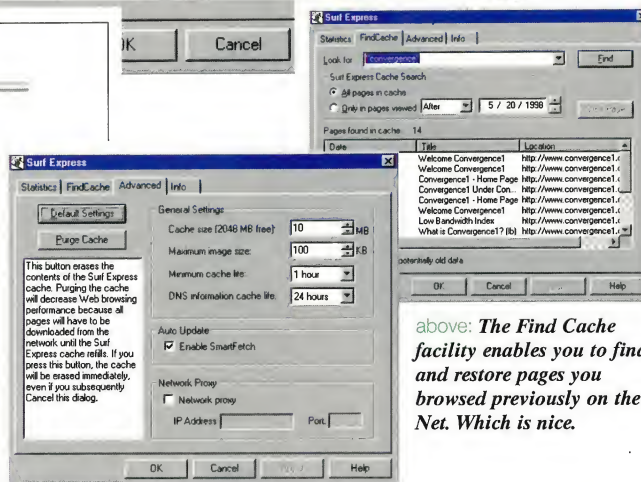


left: *The chart tells you whether pages are loaded from the Net, or more speedily from your hard disk.*



above: *Here's a Web page that Surf Express restored to its full glory from the hard disk cache.*

right: *The Surf Express cache memory is very flexible. For example, you can choose only to store small images.*



above: *The Find Cache facility enables you to find and restore pages you browsed previously on the Net. Which is nice.*



# surf express

Speed up downloads and browse pages from your hard disk with this **Net utility**. **BY GRAHAM SOUTHORN**

## SPEED UP YOUR WEB BROWSER FOR FREE

*Surf Express* acts as a kind of local proxy server for your PC. Most Internet Service Providers (ISPs) have proxy servers of their own that you can use for free. ISPs' proxy servers store copies of the Web sites that are most frequently browsed by their members. Retrieving pages from a proxy server can be significantly faster than downloading them from the Net, particularly if you're viewing a popular American site.

To use a proxy server, configure your Web browser with the address of a proxy server (which you can get from your ISP). However, it's slightly slower for viewing more obscure sites as your browser checks the proxy first to see if it can find the site.

Every hard core Internet user craves speed, speed and more speed. But once you've splashed out on a 56Kbps modem and the fastest PC your bank manager will allow, what else can you do to accelerate your dial-up access?

The answer is quite a lot actually, using software that works with your Web browser. One such application is *Surf Express* by Connectix, which speeds up your connection in two ways. First, it stores Web pages you've already viewed in Netscape Navigator or Internet Explorer. And second, it selectively fetches bits of pages that have changed since you last looked at them.

Both Navigator and Explorer place copies of Web pages on your hard disk in a temporary memory called the cache. When you return to a recently-viewed page it's loaded directly from the cache, which is much quicker than retrieving it again from the Net. What *Surf Express* does is to pump your cache full of steroids, so that pages load up almost instantly when you go back to them. Connectix claims it's 36 times quicker than Navigator or Explorer alone – and while this is difficult to verify, it certainly seems very fast indeed. It's also very useful because you often backtrack when you browse a Web site, and *Surf Express* all but eliminates the frustrating time you spend waiting for pages to re-appear.

One of the very best features of *Surf Express* is that it builds a comprehensive database out of pages stored in the cache, which you can search by entering key words that the software looks for in Web page titles or within the page itself. It then returns a list of pages stored locally, which are restored in their full glory when you double-click them. If you know roughly when you browsed the page, you can also restrict the search to particular dates to save time.

Even better, the page contains a link to the original page so that you can retrieve the latest version from the Net. This is such a good idea it's a surprising oversight on the part of Netscape and Microsoft not to include it in their Web browsers. All credit to Connectix then,

for coming up with such a well-designed cache utility for us to use.

The other way that *Surf Express* speeds things up is by keeping track of the pages you browse most often. Then, when you start up your browser again, it automatically downloads any part of the pages that have changed since your last visit. This selective pre-fetching of information is much less harmful to the Web's overloaded servers than other types of accelerator software, which download pages by following every link on a site. The Internet Movie Database and other big Web sites already block selfish software that hogs bandwidth in this way.

In contrast to random browsing, you'll see the most benefit from *Surf Express* if you often visit the same Web sites. By retrieving page furniture like buttons and menus from your hard disk, only relevant new content is downloaded from the Web. *Surf Express* seemed to be slightly quicker at loading sites we'd downloaded previously with our 56Kbps modem, but you'll probably see bigger gains if you have a slower one at your disposal.

What *Surf Express* can't do, though, is turn an old 28.8Kbps modem into a far more speedy 56.6Kbps model. Nonetheless, it is one of the most intelligently-designed and handy Net utilities on the market today. **PCR**

Developer: Connectix  
Publisher: Connectix

Contact: 0181 200 8282  
Price: £35

Recommended system: Pentium, 16MB RAM, CD drive, Windows 95, Internet access, Netscape Navigator 3 or IE 3

**For: Restores previously-viewed Web pages from your HD**  
**Against: Limited speed gains for 56.6Kbps modem users**

**eight out of ten**



# painter 3d



Paint yourself an **animated, three dimensional** world. BY MAT BROOMFIELD

Thanks to great programs like *Ray Dream*, *Bryce*, *Simply 3D* and *Poser*, almost anyone has the ability to create fantastic animated 3D worlds. With the aid of some well-designed tools, it's easier than ever to build complex and realistic models to use in your creations. But until now it's remained immensely difficult to draw the texture maps needed to create perfect surface details. With the arrival of *Painter 3D* however, things just got a whole lot easier.

3D models are more than mere wire mesh shapes. There are many additional layers that are used to increase the illusion of physical presence. The most important of these is the texture map. A texture map is a 2D picture that's wrapped around the object and whose purpose is to add colour details. For instance, if you were modelling an eye, you could model the lens, iris and pupil separately, colouring each part as you go. Alternatively you could simply wrap an eye-coloured texture map around a sphere. The latter approach is considerably easier and it saves resources.

Unfortunately, it can be immensely difficult to visualise the way that a flat picture will wrap around a complex shape and calculating areas that correlate in the 2D and 3D versions can be a frustrating matter of trial and error. All that's a thing of the past now though. With *3D Painter*, you can load in your models and paint directly onto the finished shape. You no longer need to guess how things will match up because the computer takes care of all that for you.

When you load in a model, you decide which component of the model you want to work on. With complex shapes, it would be impractical to wrap a single picture around the entire model, so it's broken down into manageable chunks. The program has a powerful hierarchic manager to handle the various object parts, and resources can be shared between multiple object parts. For example, if you are painting the patterned wheels of a gypsy caravan, once you've done one spoke, the texture can be copied to all the other spokes and the design can be copied to the other wheels.

A further extension of that is stroke duplication. *Painter 3D* can generate more than simple texture maps. It can also do bump maps,

reflection maps and more. There are times when you will want a texture to be used for more than one map and the program will automatically duplicate your designs to them in order to save time and maintain an accurate correlation between effects.

When a model is loaded, you'll need to set the size of the 3D view. The larger the view, the more memory and the slower the screen refresh rate. On a P200MMX, the program is quite useable, but on anything below a P166, it becomes a tortuous exercise.

You'll also need to specify the image size and the wrap method. These are the two most crucial decisions as they affect the resolution of the image and the way it appears. These two facets are moderately complicated, but fortunately they're explained very clearly in the user manual. Nevertheless, when it comes to generating co-ordinates for implicit mapping (the most useful type for minimising distortion on irregular shapes), it can still be a difficult and laborious task.

There is a previous release of this program called *Fractal Design Detailer*. This version includes all of the natural media tools found in *Painter 5*, whereas *Detailer* merely used a very reduced subset. That means that you can paint or draw in 2D or 3D using tools that are World-renowned for their likeness to real art materials. There are also photo manipulation and compositing tools with which you can create floating clips that can be repositioned anywhere on an object.

If you're serious about modelling, this is one program that you simply cannot afford to miss. **PCR**

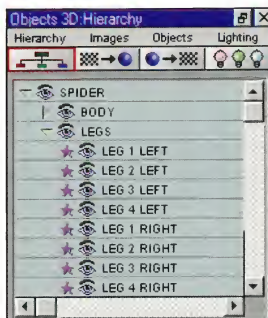
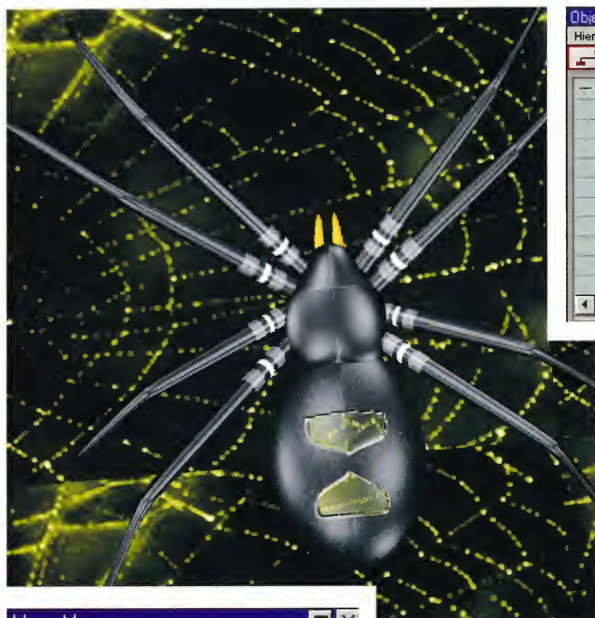
Developer: Metacreations Contact: 0181 358 5857  
 Publisher: Computers Unlimited Price: £299  
 Recommended system: Pentium 166, 32MB RAM, 30MB hard disk space, CD-ROM drive, 24-bit colour, Windows 95 or NT  
 For: The easiest way to design 3D surface textures and maps  
 Against: The program is very resource hungry

nine out of ten

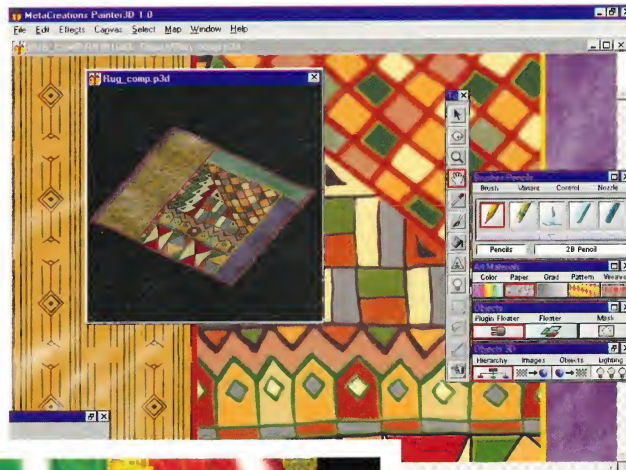
## ALL MAPPED OUT

The essence of *Painter 3D* is its ability to apply image maps to an object so that you can paint on them in real-time. The program supports six types of map: texture maps are used to add colour to an object, bump maps are used to simulate surface texture, highlight maps are for emphasising highlights, glow maps are for lighting effects such as a lamp or lit window. Reflection maps are used to specify how reflective the various parts of an object are, and finally, an environment map may be applied to reflective surfaces to give the impression of reflected surroundings.

Together, these six maps can be used to transform your models from ordinary to astounding and from cartoon-like, to ultra-real.



above: With the hierarchy controller, it's easy to copy maps from one object to another.



above: You can use *Painter 3D* to create your own version of Aladdin's magic carpet.



above: Import objects in popular industry-standard formats.

left: Use the Maps Manager to copy strokes or entire images between maps.



left: This mask uses texture, bump and highlight maps. There are three other types too.

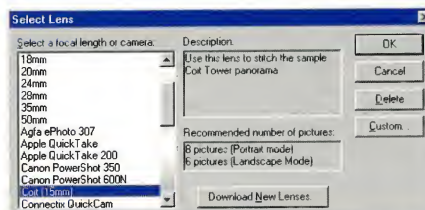




left: You can join your photos to create a 360 degree panorama.

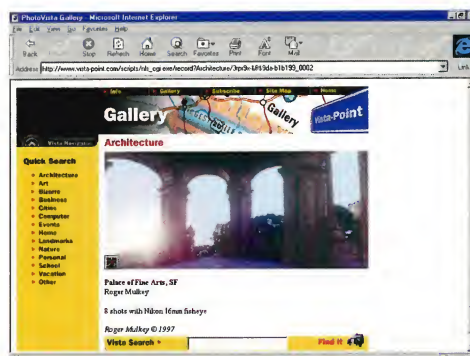


right: Use the preview mode to get an overview of how your panorama will stitch together.



left: Choosing the right lens can be an arduous task if you don't own one of the preset cameras.

below: The finished result is simply a large seamless picture that's wrapped around the shape of your choice.



right: You can visit a Net gallery to see how others are using the program.



# photovista

Believe us, you can **create unique 3D interactive photos** on your desktop. **BY MAT BROOMFIELD**

## ON THE DISC!

Come over all creative with the *PhotoVista* demo on the disc.



## CHECK OUT SOME DEMOS

If you want to see what ordinary people are doing with *PhotoVista*, you can view dozens of demos on the Live Picture Web site. Simply go to [www.livepicture.com](http://www.livepicture.com) and click on livepicture viewer at the bottom of the page to download a plug-in for your browser. Now go to [www.vista-point.com](http://www.vista-point.com) to see an index of viewable panoramas. We suggest that you start by looking at the Spotlight image first, but after that you can check out whatever catches your eye.

Photographs have been around for well over 100 years but apart from the addition of colour, for most of us the format really hasn't changed much in all that time. Now here's an exciting new development – immersive pictures that literally place the viewer at the centre of the picture.

The idea is perfectly simple yet surprisingly effective. You take a series of photos, join them together, paste them around the inside of a sphere, cylinder or cube, then set the viewpoint in the middle of the scene. The viewer can use the mouse to look from side to side or up and down.

It may not sound much different from scrolling around a conventional photo but you'd be surprised how much more real it makes things. Imagine going to the centre of an art gallery and looking around in any direction. You can even zoom in on the walls to examine a painting. Things don't need to be that highfalutin either. You could just as easily send a distant friend an image of your house or garden via the Internet.

The program's basics are extremely easy to come to grips with. You simply need to take sufficient pictures to provide an accurate 360-degree view of the scene you want create. You can do that using scanned photos, pictures taken from a digital camera, digitised frames from a camcorder, or something more exotic such as a scanned panoramic photo.

The power of the program lies in its ability to join (or stitch) the various photos together, compensating for the lens that's been used. This is also one of its weaknesses. The ideal scenario would be for the program to reconstruct a vista using as few photos as possible. The best way to achieve this is using a fisheye lens which has a very wide field of view. However, most of us won't have such tools available and will need to resort to conventional equipment.

In order for the program to do its best, you need to tell it precise details about the characteristics of your lens, and these may be hard to come by. Furthermore, you need to take overlapping

pictures. Depending on the angle of the lens, this could necessitate you taking over 20 pictures to create a single panorama. Our digital camcorder required 25 frames to create a 360-degree view with a 30 degree overlap on each picture as recommended in the manual.

If you like, however, you don't need to capture all 360-degrees of a scene. PhotoVista does give you the option to create partial panoramas so if you've ever jumped off a tourbus to snap a five-shot montage the program will still let you stitch the photos together.

Once you've digitised your photos, it's merely a matter of importing them into the program, ensuring that they're correctly oriented, and choosing the appropriate lens settings. There are numerous preset lenses covering many digital cameras and standard film camera groups. After you've done that, the program will automatically stitch the pictures together and paste them inside the chosen shape.

You can use pictures of various resolutions depending upon the target destination. Low resolution images are best for the Internet, while higher resolution is good for CD-ROM distribution, where large file sizes matter less. Taking the required photos can be frustrating and time consuming, as can setting the lens preferences. Once those stages are complete, the program itself is a doddle to use and the results really transport you to the scene of the photos.

Developer: Live Picture

Contact: 01895 456550

Publisher: Principal Distribution

Price: £39.99

Recommended system: 486DX, 16MB RAM, 35MB hard disk space, Windows 95 or NT, a source of digital pictures

For: An excellent way of letting people look around your world

Against: Taking the photos can be time-consuming and fiddly

**eight out of ten**



# picture publisher8

Could this really be a contender for the **most creative graphics program ever?** BY MAT BROOMFIELD

Just because graphics programs are seemingly ten a penny nowadays, it doesn't mean that they have to be boring. Programs like *Photoshop* may be the choice of professionals, but despite their power they can be dull, uninspiring and difficult to fathom. No program offers more features per pound than the mighty *Picture Publisher 8*.

Before you can use any of the advanced tools in a graphics program, you need to master its basic features. It's all very well having a program that does something stunning to a selected area of your picture, but if it's an arduous task to create that selection in the first place, you'll soon become frustrated. That's one area where *Picture Publisher* scores highly – it's instantly usable. You don't need to get out a huge 300-page manual just to figure out how to cut and paste or perform some other simple operation. It's a very intuitive package, and this version extends that ease-of-use right through to its most advanced features.

*Picture Publisher* has always been an underrated program, with more filters and effects than any other graphics package. This latest version takes that strength and elevates it to a new level. It's simply dripping with truly inspirational effects and it won't take long for you to realise that your imagination is a far greater limitation than the program's ability to realise your ideas. Here's a program with so many unique tools that you'll be at a loss which ones to use first. The range of options is so vast and impressive that you're in real danger of becoming overwhelmed by the number of choices.

There are dozens of simple effects such as solarisation, negative, hue change, posterisation, and so on. However, what really elevates this version above the competition is the variety and editability of the more complex effects. For instance, although Lens Flare has become a standard effect in many packages, in *Picture Publisher* there are 16 different user-selectable parameters, covering everything from the number of streaks, to the colour of the light halos.

Macros are another way that Micrografix has extended the

functionality of the effects. Macros are sequences of processes and effects that you can create and edit and which are activated at the click of a button. There are numerous ready-made macros included, many of which have evocative names such as 50s TV Noise, Ghost Glow, Sixties Flashback, Psychedelic Clouds and Parade Float. In addition to these, you can string together your own commands to build custom macros.

With all of these eye-catching effects, it might be tempting to dismiss them as mere gimmicks designed to catch your attention, but *Picture Publisher* is every bit a professional program. All the filters and effects are additions to the essential features that you require to do day-to-day work. If all you want to do is sit and composite montages, or retouch old photos, or design buttons for your Web pages, then fine, the program will handle all of that with ease. There are interactive tutorials aplenty to ensure that don't spend a single unnecessary second reading manuals when you could be editing graphics. If you want to take things further – to develop your skills both as an artist and as a graphics program user – then all of the program's unique and versatile extras will serve as a constant source of refreshment to your imagination, ensuring that you never have to sit in front of your computer struggling for an interesting way to present your graphics. **PCR**

## SNAP HAPPY

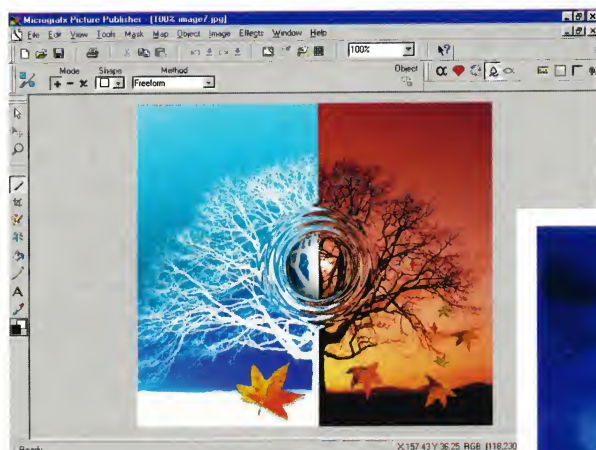
There are three ways of sourcing your own digital photos to edit on your computer. You can use a digital camera to take photos, then transfer the digital snaps directly to your hard drive. You can use a conventional camera to take photos on normal or transparency film. If you use normal film you can use a flatbed or sheet feed scanner to digitise your photos. The final solution is to have your films converted into Photo CD format by a Kodak certified lab such as Boots. They'll put up to 100 of them on a CD for you for about £25.

Developer: Micrografix Contact: 0345 089372  
Publisher: Micrografix Price: £79.90  
Recommended system: Pentium 120, 16MB RAM, 65MB Hard disk space, CD drive, SVGA graphics, Windows 95

**For:** The most exciting photo-editing package on the market

**Against:** The program has numerous minor bugs

eight out of ten



above: *Picture Publisher 8* is a tremendously inspiring and enjoyable program to use.



above: Conventional photo editing is a doddle with *Picture Publisher*.

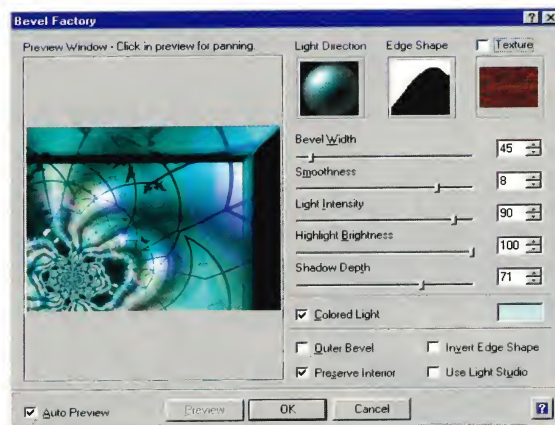


right: This is the Bevel Factory, just one of the very advanced effects tools in the program.

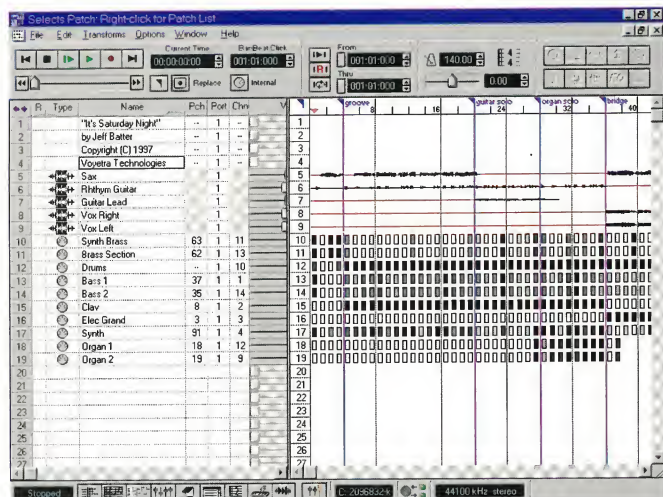
below: You can be as boring or surreal as you like. Only your imagination sets the boundaries.



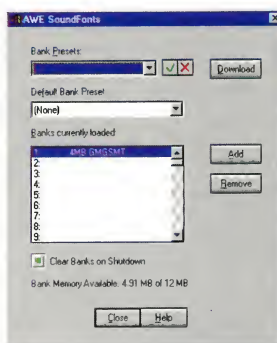
right: By combining traditional montage skills with digital effects, you can create some magical images.







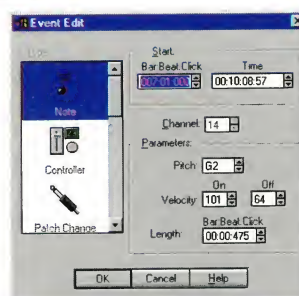
below: Although the program's sampling is basic, that means that it's extremely easy to use.



above: Orchestrator supports affordable sound cards. Here's its Creative Sound Font manager.



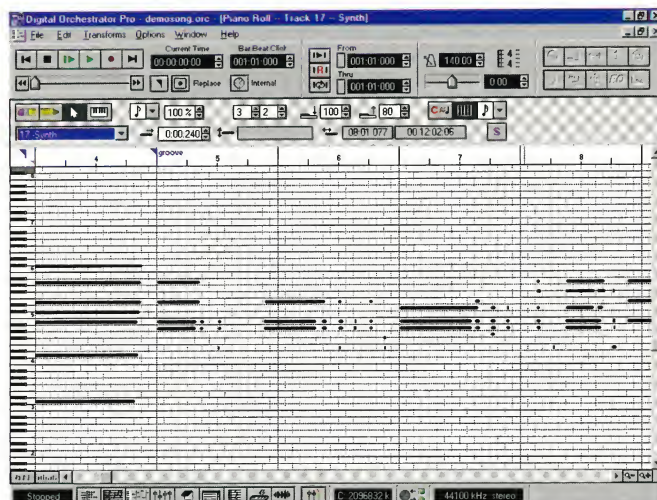
above: Here we're applying a compressor to a sample we recorded earlier.



left: Use the Event Editor to make precise adjustments to musical events.

left: Looks can be deceiving. Digital Orchestrator is much better than it initially appears.

below: Unfortunately, the program has a very bland and colourless appearance.



# digital orchestrator<sub>pro</sub>

Here's a pro sequencer for **half the price** of the leading programs. Sound good? **BY MAT BROOMFIELD**

## ON THE DISC!

Feeling musical? Try your hand with the demo on the CD Review disc.



## CHOOSING A MIDI INSTRUMENT

You can connect various MIDI devices to your computer for use with a sequencer. If you can play an instrument, you'll probably want to connect a MIDI keyboard. You can either use a combined keyboard and synthesiser which has its own on-board sounds, or a dedicated controller keyboard which is used purely for playing in MIDI music, but which uses your computer's sound to make it.

There are probably more Voyetra digital sequencers in people's homes than any other brand. They're given away free with everything from soundcards to MIDI keyboards, yet very few copies are actually sold over the counter. With the latest powerful audio version, Voyetra is ready to take on the Godfathers of sequencing: *Cakewalk* and *Cubase*. The only question is, does Voyetra want to forge new ground, or simply follow where others have led?

At first glance things don't look promising at all. The track window is painfully reminiscent of the uninformative design that *Cakewalk* left behind several years ago. The main thing that lets it down is the display on the right of the window, which rather than representing MIDI data as blocks whose length denotes their duration, simply uses grey bar-length blocks that impart almost no information about the music they represent.

The idea of a program such as this is to facilitate the recording of MIDI and sampled music in the easiest and most intuitive manner. Your compositions may consist primarily of sampled loops and sound effects like much garage and jungle music, recorded MIDI performances in the style of electronic musicians like Mike Oldfield or Jean-Michel Jarre, or a mixture of the two approaches two using MIDI instruments and sampled vocals for instance. The point is, the sequencer should be an aid to the composition process, not a hindrance. It should be to a musician what a notepad is to a writer – a tool for quickly and easily expressing and recording ideas that you want to explore further or store for posterity.

Despite its poor first impression, *Digital Orchestrator Pro* is exactly that. It's very easy to use, yet it has the underlying power that's essential if you are to breathe life into your ideas. Perhaps most of the fundamentals of sequencing are so long established that it would do more harm than good to start changing them, but the program's authors have clearly approached the subject with open minds. For instance, audio data is displayed on the track window as a waveform – nothing new there. What is unusual, is the fact that you

can cut and paste any part of any waveform directly on this window, rather than returning to a waveform manager or sample editor. That means that it's far easier to go from conception to realisation because there are no idea-quenching detours along the way.

In all honesty, the program isn't on a par with *Cubase* or *Cakewalk*. It doesn't have the depth of features. Both programs have made great advances in their sample handling and processing over the last year, and plug-ins are a particularly useful innovation in both packages. Even so, *Digital Orchestrator Pro* is a very powerful and versatile program, with all the tools that 90 per cent of users will ever need.

You can record yourself playing a bad version of 'Respect' on your MIDI keyboard and the program will pull your notes back into time. You can even sample the girl next door doing the Aretha Franklin vocals and use the built-in equaliser to transform her reedy voice into something altogether more substantial.

The program also recognises inexpensive home equipment and sound cards, so whether you have a £2000 synth or a £40 XG card, you can get the very best out of it. It's particularly nice to see direct support for the AWE64's Sound Fonts.

At £160, *Digital Orchestrator Pro* is a substantial sequencer for musicians who want the power, but who're unlikely to need the costly extras offered by the industry-leading packages. **PCR**

Developer: Voyetra  
Publisher: Et Cetera  
Contact: 01706 228039  
Price: £159.99

Recommended system: P90, 16MB RAM, CD ROM drive, sound card, MIDI keyboard (optional), Windows 3.1 or 95

For: Easy to use and has a very nice pop-up interface

Against: Its track window is quite uninformative

eight out of ten



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*Defeat: A fine printer, despite Epson's annoying print speed claims.*

# epson stylus 850

The Stylus 850 is Epson's latest **a colour office printer** at a home price. **BY MAT BROOMFIELD**

**T**he Stylus Colour range has been tremendously popular for Epson, taking the company to number one in the home market. The one simple reason for that is quality. Epson has proved that you can get better-than-colour-laser quality for only a couple of hundred pounds. Now, Epson has upgraded the Stylus 800 model to produce a printer with extra features for the office worker and serious home user.

The 850 is a robust printer that appears to have been designed with a heavy workload in mind. At its core is Epson's superb ink-jet technology enabling it to deliver images at up to 1440x720 dots per inch (DPI). Quoting DPIs is not always an accurate way of describing quality because a number of printers that work at lower values have enhancement technologies to compensate. However, as Epson has the most advanced print engine in the business, this resolution only serves to combine with its other features to provide superb quality.

The 850 is supposedly Epson's fastest ever ink-jet printer, offering monochrome print speeds up to nine pages per minute and colour speeds of only half a page per minute less. If such claims are not outright lies, they're certainly extremely disingenuous. It's just Epson's attempt to make the printer look better than it is. In reality, at the highest resolution, using the best paper, it takes 10 minutes or more to print a single colour page on a fast PC. Epson's quoted speed is achievable printing text only at low resolution, but so what?

That's not how you're going to use the printer. You're hardly going to buy a superb high-resolution photo-realistic printer only to print nothing but text at low resolution and the way that Epson quotes its performance is akin to giving a car's speed and fuel economy when driven at zero G in a vacuum on infinitely straight roads...

The sad thing is, Epson doesn't need to resort to sharp practices like that. You don't buy the Stylus for its speed, you buy it for its breath-taking quality. There simply is not another ink-jet printer available that equals or exceeds it. You've probably already read about Epson's advanced meniscus control that produces very small, very precise dots of ink. You've also read about the special ink formulations that contribute to its high quality. Remarkably, Epson has managed to reduce the dot size further and increase the precision of the delivery.

On plain paper costing £1.50 for 500 sheets, the quality is very good, but on one of the superior grade photo papers, it's outstanding. If you look closely, you can just about see the ink dots on the paper, but at a foot or more from your eyes, the quality is photographic. Incidentally, the 850 uses two ink cartridges; a combined three-colour cartridge and a black one. At £15 to £25 for the colour cartridge, it would have been nice to see three separate carts so that there's no waste when one colour runs out. Time after time we hear of people using refill ink instead of the proper Epson cartridges. Time after time, we hear of these refilled cartridges delivering inferior results. It just isn't worth it.

The 850 supports optional network and postscript cards. Both enable it to be used in a professional environment, for proofing using its advanced colour matching drivers which come as standard. The 850 is a stunning printer which is fairly inexpensive to run. **PCR**



## Also by the same author...

Epson has been busy this month – it's also released a new version of the Stylus Photo called the Photo 700. The new model uses a six colour print system which is particularly good for printing skin tones. At 1440 DPI, this model offers double the resolution of its predecessor and it has all of the latest generation quality enhancement features found in the 850. Among its other more interesting features is the ability to print panoramic format photos on extra-long paper. The Stylus Photo 700 costs £318.43.



Developer: Epson  
Publisher: Epson

Contact: 01442 261144  
Price: £374.83

Recommended system: Pentium, 32MB RAM, 50MB hard disk space, VGA, EPP Parallel port, Windows 3.1 or 95

**For:** Great quality, low running cost and great versatility

**Against:** The resolution means slow print times

**nine out of ten**



# shared ware

You can buy an **extra PC for as little as £206**, so where's the catch? **BY MAT BROOMFIELD**

**T**here are many times when an extra PC can really come in handy. Perhaps you want play network games against your friends, or two kids are queuing to do their homework on a single machine. Maybe you find it easier to run different applications on different machines. Whatever your reasons, most homes find it hard to justify the price of a second computer. However, thanks to an innovative new product called Shared Ware, you can now buy a second PC for the price of a printer.

So how can you buy a Pentium PC for only £206? Well, you're not actually buying a whole extra PC – Shared Ware gives you the components to enable you to double up the computer you own. The system is simple to install and very basic-looking. It consists of a compact 16-bit ISA card, a connecting lead and a small distribution console. The card goes into your PC but it doesn't require IRQ or DMA settings, so it'll happily co-exist with lots of other upgrade cards. The console goes wherever the second PC is to be situated, and the lead joins the two. You then connect a keyboard, mouse and monitor to the sockets on the console. Once the drivers have been installed, the system is ready to go. (You can buy Shared Ware complete with a keyboard, mouse and 14-inch monitor for £323.)

The host system needs to be switched on in order to use the second station. It acts like a server, sharing all its resources with the terminal that Shared Ware creates. You might think that this would mean a massive drop in performance, but our tests proved otherwise. For most day-to-day programs like word processing it was fine – only processor-intensive apps like 3D rendering gave it problems.

The system relies upon Windows 95's multi-tasking abilities and it uses it to brilliant effect. When you think about it, for the vast majority of the time that you're using software, the processor is pretty idle. A Pentium II is far more powerful than the requirements of most programs. When you use a word processor, the CPU isn't exactly straining to cope with the amount of data that you're generating. Similarly, when you use a graphics or music program, you probably spend more time thinking than actually doing.

In such circumstances, Shared Ware is ideal. Two students can work at the same time, or you two employees can have a computer for little more than the cost of one. You can even share a single Internet connection, so that two of you surf for the price of one.

Inevitably there are limitations, though, some of which are quite serious. The biggest of these is the fact that the second machine has no sound. The Shared Ware board contains the essential Input/Output (I/O) sub-system, including mouse and keyboard controller and graphics chip. A version that includes a sound chip will be developed, but no release date has been set. Another serious restriction is the fact that neither machine can drop out of Windows into DOS, so you can't run applications which work under that OS.

On the subject of games, it can run multiple copies of many games, and even CD-based titles. Remarkably, it can even run network games, enabling the host player to compete against the Shared Ware user. Sadly, it seems completely hit-and-miss whether or not a specific title actually works. Sometimes the problems are caused by in-game protection; other times from lack of sound; and also by the inability of two users to use a CD-ROM at the same time.

All of which only goes to confirm that, good as it is, Shared Ware is aimed at serious minded users who need to run two productive workstations at any one time. In that capacity, it performs quite well, and is much cheaper than buying a new PC. **PER**

Developer: Sharedware Ltd Contact: 01274 401010

Publisher: Sharedware Ltd Price: £206

Recommended system: P166, 32MB RAM, 1MB hard disk space, 2 mice, 2 keyboards, 2 monitors, Windows 95

**For:** An inexpensive way of adding another PC to your household

**Against:** Some PC resources cannot truly be shared

eight out of ten

## NETWORK SHARING

Broadly speaking, Shared Ware enables the second user to access any network or Internet connections supported on the host machine. However, it also provides for a range of peer-to-peer networking options between the primary and secondary machines.

Because both users are already sharing the same hard drives, data transfer is not an issue. For example, you can create direct cable connections or configure separate TCP/IP addresses that enable the two users to play *Quake* or *Doom* against each other. The technology isn't perfect, because many programs do not permit multiple instances of a single installation to run at the same time. There's a big copyright issue that prevents the manufacturer from simply tricking programs into thinking that there's only one copy running at a time.

*below: Thinking of buying a second PC? With Shared Ware, you can share the one you've already got, for just over £200 – or just over £300 with a keyboard, mouse and monitor.*





## Why is there a modem speed limit?

A number of factors combine to limit the upper speed at which you can transfer data with a modem. The most fundamental of these is the frequency of the phone line. Even under perfect conditions, British phone lines can only transfer

data at 64 kilobits per second (kbps). However, line noise, signal degradation caused by imperfect computer components and distortion caused by the conversion process from digital to analogue reduce this figure to about 35kbps per

second where modems are concerned. There's no problem with quantization noise when going from analogue back to digital. This is the reason why computers with digital connections to the phone system transfer data at up to 56kbps.

# Boxing clever

Modems are the key to your membership of the global village. **BY MAT BROOMFIELD**



## What about the future?

There are two ways in which we're likely to see more efficient data communications in the future. The most obvious is that phone companies will eventually replace all of their old cables with optical connections. This is well under way already, but the bottleneck is in the connection from your house to the main cable. The phone companies may decide to make ISDN much cheaper. ISDN is a high-speed digital system that enables data

transfer speeds of up to 128kbps. Currently, BT charges £99 for an ISDN connection, but the modems are more expensive than 56kbps models. However, as some European countries have demonstrated, affordable ISDN can have a vital role in narrowing the technological chasm between us and our American friends who don't have to worry about modem speeds thanks to free local calls.

Nobody but the most obstinate or ignorant commentator could deny that computers are going to play a massive role in every element of our lives in the future. Some see them as an oppressive force infiltrating themselves into everything, whilst more optimistic viewers see them as the heralds of a bright new era of global communication and co-operation. A world where dark secrets are hard to keep, exciting information can be shared in an instant, and where we can all be enriched by the multi-cultural exchange of ideas.

It's clear that electronic communication holds the key to the future. Computers enable us to say in a minute, what would take hours by voice. If you prefer the human touch, you can use Internet phones to talk to people anywhere in the world for the price of a local phone call.

## It's good to talk

Like most areas of technology, modems have steadily become more and more advanced over the past ten years. Prices have plummeted and specifications have improved. However, there's a natural upper-limit on how much better they can become, and we've finally reached it.

Modems that work over the standard phone system are inhibited by a number of factors – not least by the quality of the lines. Manufacturers have twisted and turned every which way in an effort to improve performance, and the best that they've been able to do is 56kilobits per second (kbps).

In order to access 56K transfer speeds, you need to be connected to a computer that uses a digital connection, as opposed to the analogue ones we use in our homes. This digital connection reduces (in one direction) the amount of signal processing that needs to be done in order for data to be sent down the phone line. The end result is a download transfer speed of 56kbps, and an upload speed of just 33.6kbps. Both speeds assume perfect phone line quality.

## Unhealthy competition

There are two competing technologies that offer this throughput. One is called x2 and is used solely by US Robotics; while the other is named K56Flex. Both provide the same data rate, but require specific support at the other end. Thus some Internet Service Providers (ISPs) support one protocol, and the rest support the other. The existence of rival technologies is damaging to the industry because it complicates still further a technology that's already fraught with hurdles to overcome.

Fortunately, the main players have finally got their act together and has come up with a unified standard called V.90, which encapsulates the best of both technologies. Modems have, for some time, offered a voice capability, including built-in answering machines. However, the latest trend is for modems to operate in this mode even when your computer is switched off. (You might be energy conscious or simply reluctant to leave your PC turned on while you're out of the house.) Whatever your reason, there's now a modem to suit your needs down to a tee. Here, we take a look at some of the latest models to hit the market, and assess their performance and design... **PCR**



## Premier MT56Ke

The Premier is an uncomplicated modem that does most of the things that you could possibly ask. It's based on Rockwell's K56Flex technology. This is far and away the most popular of the current 56K technologies. What's more, it's also one of only two that came with V.90 code, which you can install yourself. And because it's flash-upgradeable, you can always update it if the manufacturers find some way to enhance performance still further.

The trouble with a round-up such as this one, though, is that all of the products are virtually identical when it comes to their most important attribute: speed. In such cases we need to look to other features such as build-quality, price, additional functionality and software.

Sadly, the Premier is not a self-memory modem like the Sportster, so that means your computer has to be switched on to use the answer phone and fax functions. However, it does provide a hands-free speaker phone and full voice functionality. You can even plug your phone into the modem so that you don't need to use a line splitter. There are also sockets so that you can attach a separate microphone and speakers to if you want.

The modem includes the popular *Trio Communications* suite comprising voice, fax and data software. And what of the design? Well, the case is very basic with no switches or controls – but nevertheless, it's perfectly functional. The kit includes all cables and plugs that you'll need to get started straight away.

The instructions that accompany the Premier are very



spartan, but they're enough to get you up and running. Additionally, if you do find that you need more help, you

can avail yourself of Eurotech's free lifetime technical support phone service. It may not be the flashiest modem, but it's fully featured, and for the money you'll have few complaints. Why spend more?

Developer: Premier  
Supplier: Eurotech  
Contact: 0118 981 0011  
Price: £99.95

**For:** Excellent, well-rounded modem at a fair price

**Against:** Comes with minimal instructions to hand

nine out of ten

## Safire 560 Voice

Although Lasat has never been a particularly big player in the UK modem market, there's nothing at all wrong with this model. It's certainly one of the two best-made modems in the round-up, with nice, easily accessible volume and power buttons on the front panel. There are also microphone and speaker connections at the rear, as well as a phone connector so that you can hook up your handset.

The unit is also particularly compact, which makes it ideal if you're short of desk

space. It supports both K56Flex and V.90 protocols and, unsurprisingly, it's flash-upgradeable. It also includes the *Trio Communications* suite of software, so you have everything you need to utilise both its data and voice features straight out of the box. Overall, the Safire is a very good modem at a reasonable price.



Developer: Lasat Comms  
Supplier: Etna  
Contact: 01952 428 888  
Price: £94

**For:** Compact, elegant and well made modem

**Against:** No self-memory mode included on the machine

eight out of ten

## MT5600ZDX

Multitech is a company that's better known in the business market than as a supplier of modems to home users – the reason being that it's just too darned expensive. This modem is a quality product, with all sorts of clever technical abilities and certifications – but the only trouble is most home users don't require or want the features on offer.

When it comes to the stuff we do want, the modem reveals itself to be lacking. Importantly, it has no voice capabilities

whatsoever – not even the sound card-dependant answering machine offered by Diamond's SupraExpress. It uses K56Flex technology for high-speed data reception, and it is flash-upgradeable. However, you're never going to see an upgrade that enables you to add audio to it. This is Multitech's least expensive model, and if you only require data, you may prefer to spend a little extra to get this sort of quality.



Developer: Multitech  
Supplier: Multitech  
Contact: 01189 597 774  
Price: £117

**For:** It may be basic, but it does the job  
**Against:** Features too limited and there's no voice support

seven out of ten

## SupraExpress 56

Now that the phone companies are fiercely competing for your business, many of them are offering extra lines for free. If you have two lines, it may be that you don't need a speaker phone – and so this inexpensive modem may well be worth considering.

It does incorporate an answering machine, but unlike the others, you'll need a sound card to record and play back messages. In some ways this simplifies matters because you don't need to allocate

resources or spend time setting up a dedicated modem wave device. Other than that, the SupraExpress is basic and wholly unremarkable. It supports K56Flex and V.90 and is flash-upgradeable. It also includes an integrated serial cable, which none of the other manufacturers do for some reason. All in all, this is a straightforward modem that does exactly what it's supposed to.



Developer: Diamond  
Supplier: Diamond  
Contact: 01189 444 400  
Price: £79.99

**For:** An uncomplicated device, supports all the standards  
**Against:** Needs a sound card for its voice functions

eight out of ten



## Pace 56 Voice

**L**ike the MessagePlus, this Pace modem costs more than most and is very nicely constructed. However, whereas the MessagePlus can at least claim a self-memory mode, this one doesn't have even have that to justify its price.

It uses the K56Flex standard to offer 56K data rates from your ISP, but it doesn't yet have a V.90 mode – although you can upgrade it via the integrated flash memory BIOS when the code becomes available.

The one thing that really elevates this

modem above the competition is the sheer weight and variety of its software. Pace hasn't gone with any heavyweight packages on the market, but it has included everything from fax managers to virus killers. Better still, thanks to the beautiful front-end, the hardware and software that's supplied is extremely easy to install and get up and running.



Developer: **PMC Electronics**  
Supplier: **PMC Electronics**  
Contact: **0990 561001**  
Price: **£139**

**For:** Good software bundle, built-in speakers, caller ID  
**Against:** But you do pay a price for all these features

eight out of ten

## 56K PCI Modem

**P**C builders tend to favour internal modems, both for their lower price and because there are less support issues. However, there's little reason for most home users to take on the additional aggro that installing one entails.

Despite that, if there's some reason why you feel drawn to this type of modem, you may be impressed by the fact that this particular model connects via a PCI slot, rather than the conventional 16-bit ISA slot. It doesn't affect the data throughput,

but it means that the modem occupies less processor time and thus enables your PC to multi-task with more efficiency.

The modem uses the K56Flex protocol, but as you would expect, it's also fully upgradeable to V.90 as soon as Aztech converts Rockwell's code and makes a driver available.

If you want an internal modem and aren't worried about the pretty packaging that other modems have, this is it.



Developer: **Aztech**  
Supplier: **Eurotech**  
Contact: **0118 981 0011**  
Price: **£69.95**

**For:** Inexpensive, and the only PCI modem we've ever seen  
**Against:** Installation, plus it occupies a motherboard slot

seven out of ten

## Communicator ESP

**T**his was a very close contender for first place. It's a flash-upgradeable K56Flex model, and had Trust been able to confirm that a V.90 upgrade was on its way soon, it would have easily won.

The modem is plain to look at, but then it doesn't need to be a work of art. It has sockets for a phone as well as speakers and a microphone. It's also the only model that actually comes with headphones and a microphone too.

In terms of software, this modem

incorporates *Super Voice*, the package favoured by US Robotics and Eurotech. It's an integrated suite enabling you to configure the fax and answer phone.

And what else do you get for your cash? Well, the modem comes with all the cables you need – for only £70, it really is well worth a look. Or would you rather pay another £50 for the colour co-ordinated case and free Internet trials offered by some rivals?



Developer: **Trust**  
Supplier: **Aashima**  
Contact: **01376 502 050**  
Price: **£69.99**

**For:** Fully featured and cheap communications solution  
**Against:** No self-memory mode on the machine

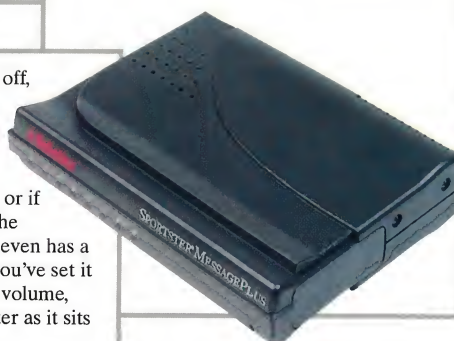
eight out of ten

## Sportster Message Plus

**U**S Robotics has simplified its modem design recently, removing some of the nicer features that helped justify the high price tags. The Message Plus uses USR's proprietary x2 technology which is not as widely supported as K56Flex.

Courtesy of its flash-upgradeable BIOS, it also includes V.90 code to see it into the future. The thing that makes this modem stand out from the competition is the fact that it's the only self-memory model in the round-up. That means even

when your computer's switched off, the modem continues to function both an answering machine and a fax. It's great if you're worried about your computer's power-consumption, or if you're going away for a while. The modem is beautifully made and even has a volume switch. However, once you've set it up you won't need to adjust the volume, and the build-quality won't matter as it sits hidden behind your computer.



Developer: **US Robotics**  
Supplier: **3Com**  
Contact: **0800 225 252**  
Price: **£99**

**For:** Well made, the only one with a self-memory mode  
**Against:** Expensive, needs a sound card for some features

eight out of ten

## Table

Model	Sportster MessagePlus	Communicator ESP	56k PCI Modem	SupraExpress 56e	Safire 560 Voice	Pace 56 Voice	MT5600ZDX	Premier MT56Ke
Answering machine	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Self memory mode	Yes	No	No	No	No	No	No	No
Flash-upgradeable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Protocols	x2 & V.90	K56Flex	K56Flex	K56Flex & V.90	K56Flex	K56Flex	K56Flex	K56Flex & V.90
Score	8/10	8/10	7/10	8/10	8/10	8/10	7/10	9/10





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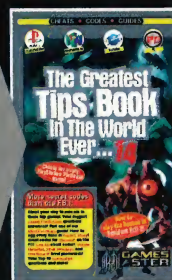
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## how to create a panorama with... photovista

### ON THE DISC!

You'll find the *PhotoVista* demo and some images to stitch together on CD Review.



Try this amazing program that **builds scenes from your photos**. **BY MAT BROOMFIELD**

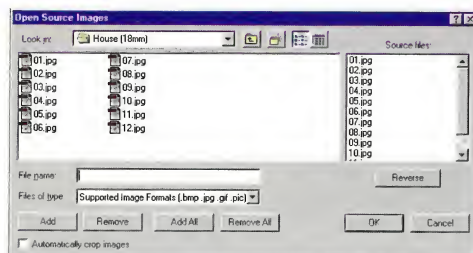
**T**hey say a picture speaks a thousand words, so imagine how much needless chit-chat you can save with a 360-degree panorama that your friends can look around? *PhotoVista* creates exactly that: photos that place you inside the picture. It takes a series of photos and stitches them together seamlessly, and the resulting mega-photo is used as wallpaper and pasted onto the inside of the shape of your choice – a sphere, a cylinder or a cube.

Once you've created the panorama, you can either publish it to an Internet gallery, or, using additional server software, you can incorporate it into your own Web site. If you don't need to upload your work to the Internet, you can create much higher-resolution

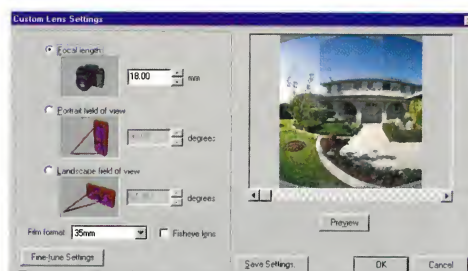
panoramas that the viewer can zoom in on to see additional details. Such files are ideal for architectural or educational purposes.

Therein lies one of the great strengths of this program, because the end results are not simply fixed photos – they're interactive. You can pan around the scene, looking up and down and changing the magnification as well, which results in an interesting and immersive experience. It's not exactly like being there – it's not even like being in a 3D game – but it's certainly the next best thing.

A number of factors determine the maximum image resolution that can be used in *PhotoVista*. The most important is a combination of the number of frames, the amount of memory on your PC, and



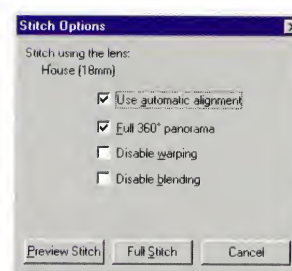
**1** The first stage is to import the images that will form your panorama. We've included two sets for you to practice with in the *House* and *Coit* directories on CD Review. Click the gadget labelled *Open Source Image* and select all of the pictures that will form this panorama. If you're using our sample images, choose all the images in the *House* directory. When you click OK, the pictures will be displayed sequentially in the main window.



**2** If you find that your pictures aren't all correctly oriented, use the *Rotate* and *Flip* buttons at the top of the screen to do so. Before the program can stitch the pictures together, tell it which lens you used by clicking the *Camera* icon. Select the *House* (18mm) lens. As you see, there are numerous pre-set lenses, but by entering the focal length of your lens in millimetres, you can create a custom profile.

**3** Now you've chosen or created a lens, you can create a panorama. Click the *Stitch Panorama* button at the bottom of the screen and you'll see several options. If you took your photos

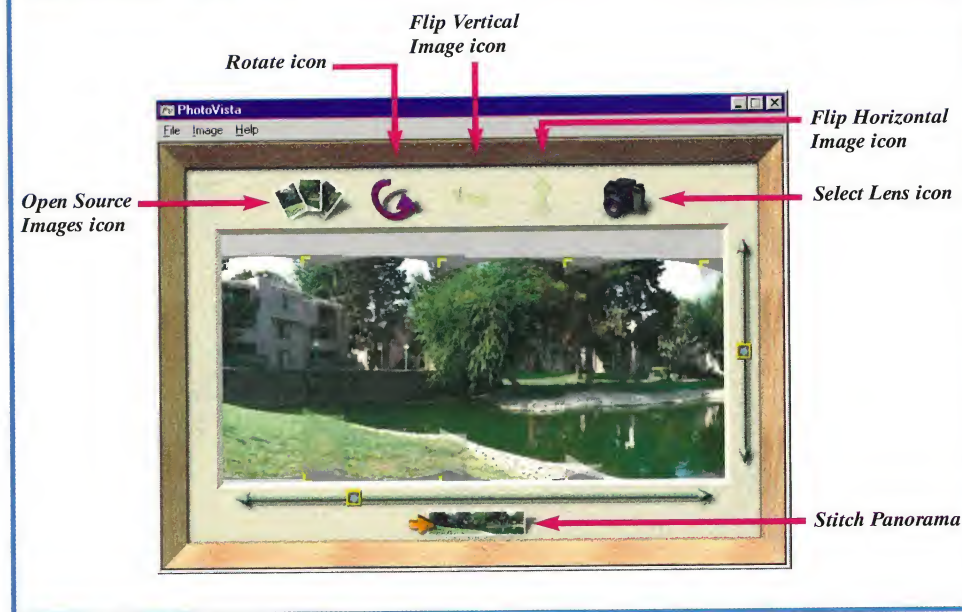
with a proper panoramic camera, the pictures will already be warped, so click the *Disable Warping* option. If you don't want the program to blend the edges of each picture, disable that too. *Blending* softens picture edges to compensate for imperfections from one frame to the next, but you may not require it. *Preview Stitch* confirms the alignment of your images, but we'll use the *Full Stitch* option.







## Guide to PhotoVista



## Simplify your photography

The biggest task in creating a panorama is taking the photos and transferring them to the PC. Therefore, anything you can do to reduce the number of photos that you need to take and convert is a good thing. The easiest way of doing this is to use a fisheye lens. This is a special dome-shaped lens that increases your field of view massively, and is especially useful for creating spherical panoramas. A good fisheye lens is expensive, but can give you up to a 180-degree field of view in a single photo.

whether or not Windows automatically handles virtual memory. Advanced users may wish to disable Windows' handling of virtual memory if you have a large amount of physical RAM. Unless you know exactly what you're doing, you may simply prefer to limit yourself to resolutions of 640x480 or less.

Overall, though, the program is very easy to use, and the version on *CD Review* is identical to the full commercial package but for two small details: you can't use it to publish your panoramas to the Internet; and it imprints your finished scenes with a watermark. But don't let that hold you up. Go ahead and make a scene, then see our review of *PhotoVista* on page 80. **PCR**

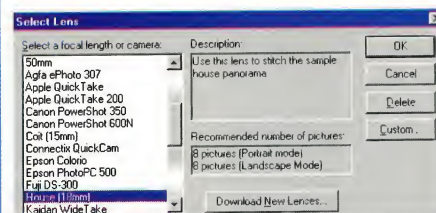
## Create a custom lens

If your camera is not among the ones listed in *PhotoVista*'s lens list, you should first visit the Live Picture Web site to check if a lens profile has been uploaded there. The address is [www.livepicture.com](http://www.livepicture.com). If a profile isn't available, you'll need to make one. Look inside the front ring of your camera near the lens, and it'll probably tell you the focal length in millimetres. Enter this value into the Focal Length field of the Custom Lens dialogue and *PhotoVista* automatically calculates the field of view and any distortion factors. If you know from your camera manual that the field of view settings are incorrect, you can manually override the default values.

## Taking photos for PhotoVista

While we may have provided two sets of images for you to test *PhotoVista* with, it's much more fun to take your own. Here's some advice on taking pictures to use with *PhotoVista*.

**1** First, you have to select a camera. You can use just about any one to create photos for use in the program. The simplest option is to use a digital camera, because the pictures don't require further digitisation or conversion. Or, you can just as well use a video camera and digitise the required frames using a capture card like *Snappy* or *Rainbow Runner*. If you use a conventional camera, you'll need to scan the photos in using a flatbed or slide scanner.



**2** Now take your pictures. Although *PhotoVista* is very tolerant of imperfect conditions (such as variable lighting, movement in a scene and different viewing angles), for best results it's far better to consider these factors before you start taking pictures. Try to avoid working in areas where you'll be moving in and out of shadows, and where possible use a tripod. Don't change the zoom settings of your camera as you pivot. Before you set out, enter the details of your camera into *PhotoVista*'s Lens dialogue, and the program recommends the number of photos that you need to take to create a complete panorama.



**3** Time to feed your images into your PC. As we've already said, the ideal source of photos is a digital camera, because it involves the least amount of work. However, the resolution is usually quite low. If you plan to upload your panorama to the Internet, 320x240 is an adequate size for each frame. However, for off-line multimedia, use larger sizes to provide more pleasing results. If you're scanning or frame-grabbing your images, you can easily use resolutions of 400x600 or more. There's one critically important factor to consider when importing pictures: if you apply any processing to one image, you must apply identical processing to all images. Furthermore, every image must have the same dimensions.



**4** *PhotoVista* needs an overlap of 10 to 50 per cent of the picture's width to find enough points of comparison in stitching. If the program can't align the images because the overlap is insufficient or the image hasn't got enough alignment cues, do it manually by selecting the misaligned frame in the main window. Red markers show it's selected. Use the cursor (arrow) keys to nudge the frames along.



**5** After stitching, you see a large picture (probably distorted, but this is normal). The picture is not designed to be viewed as a flat-object. Rather it's created with the intention of pasting it in a curved shape. Go to Show Viewer in the Panorama menu. You can now scroll around freely – it's as if you're standing right in the middle of the scene. That's it, but don't forget to save your work before you quit.





# how to rock the net with... mp3

## ON THE DISC!

You'll find all three of the programs you need for this tutorial on this month's CD Review. Alternatively, they're on the Web at: XingMPEG Encoder [www.xingtech.com](http://www.xingtech.com) CDCopy [www.cdcopy.sk](http://www.cdcopy.sk) WinAmp [www.winamp.com](http://www.winamp.com)



Take advantage of this amazing **Internet music compression** technology. **BY GRAHAM BARLOW**

There's been a lot of interest in the media lately about MP3. It seems that this seemingly harmless standard of audio compression has caused a few legal wrangles on the Internet. It's not the standard itself that's the problem – it's what people are doing with it.

MPEG1 layer 3, or MP3 for short, enables you to post high quality music to your Web pages at a fraction of the size of previous compression standards. And, the quality is so good that the record companies, who have previously been turning a blind eye to their CD tracks appearing on Web sites, have started picking up their phones and calling their lawyers.

It's a simple matter these days to copy a CD track, compress it using MP3 technology and then upload it to the Web. David Geffen of the Geffen record label has taken out injunctions closing down more than 250 Web sites that were providing illegal recordings of CD tracks across the globe.

Leaving aside such legal matters, MP3 is a great way to store high quality music on your computer or Web page, without it taking

up too much space. CD tracks recorded in WAV format can be anything up to 40MB in size. With MP3 you can knock that down with a 12:1 compression ratio, saving lots of valuable hard drive space and losing hardly anything in quality.

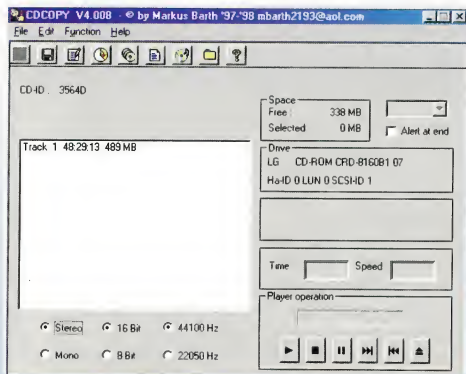
If you're not already familiar with MP3 technology, then this tutorial is set to show you how to record a CD track, convert it to MP3 and then play it back using an MP3 player. Once you've got your MP3 player installed, you can then go online and download any MP3 file from the Net for your listening pleasure. But, do try not to break the law.



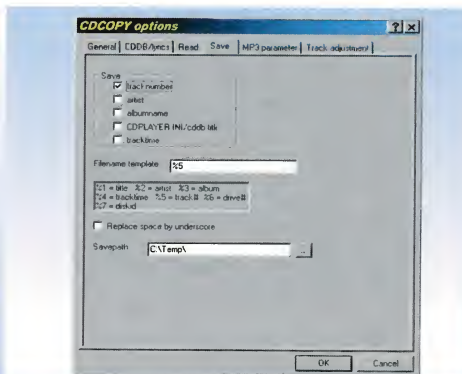
## Copying your CD track

Before you convert your track to the MP3 format, you need to copy it as a WAV file onto your hard drive. The process of copying a CD track on your hard drive is known as 'ripping'. We're going to use a program called

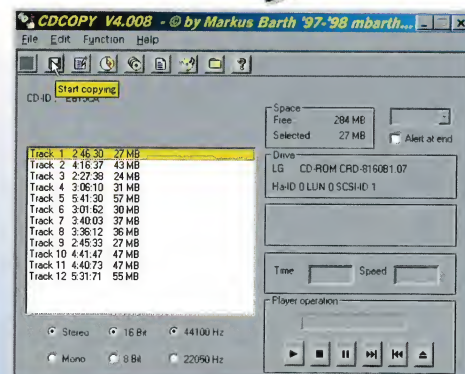
CDCopy to rip your tracks. CDCopy is shareware, so if you continue to use it, don't forget to register with the author.



**1** Install CDCopy from our menu and click the *cdcopy.exe* file to launch it. You should see a screen that looks like this.



**2** From the File menu, choose Options and select *c:\Temp* as the default save directory in the Save tab. Make sure WAV is the default file format selected in the General tab.



**3** Highlight the track you want to record and hit the Copy button on the toolbar. It takes a few minutes to record the track, which appears in the Temp directory when it's finished.

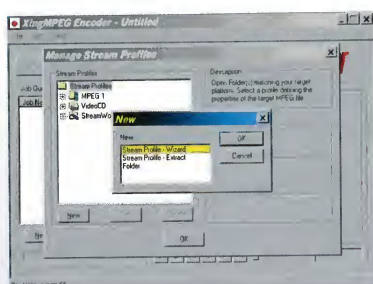




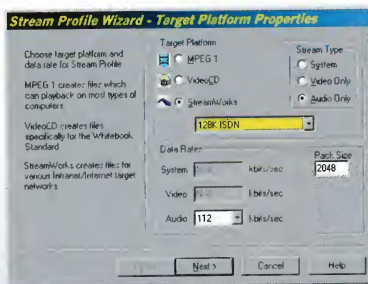
## MP3 compression

We're going to use *XingMPEG Encoder* (shareware) to compress the WAV file. It's a bit tricky to set up, but its fast

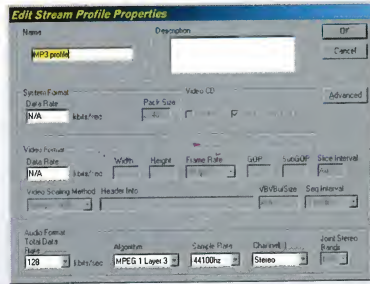
encoding speed makes it worthwhile. To enable MP3 encoding, you need to edit an existing profile. Here's how...



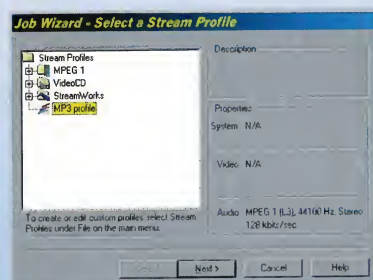
**1** Install the program from the CD *Review* menu and run it. Click on *File*, then *Stream Profiles* and *New*. Choose to use the *Stream Profile Wizard* and click *OK*.



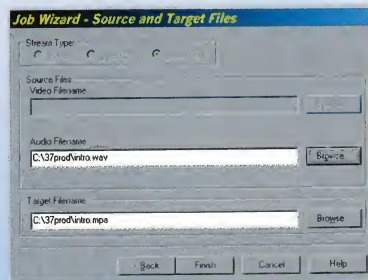
**2** Choose *Streamworks* as the *Target Platform* with *Audio Only* and *128K ISDN* selected. Click *Next*. You don't need to change any properties on this next screen, so hit *Next* again. On the last screen enter '*MP3 profile*'. Click *Finish*.



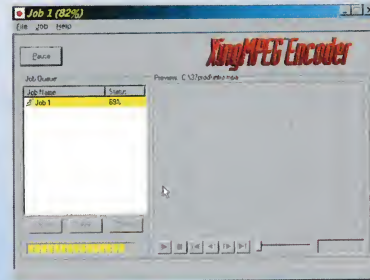
**3** Select your new *MP3 profile* and hit the *Edit* button. Change the *Algorithm* to *MPEG 1 Layer 3*, the total data rate to *128*, the sample rate to *44100 Hz* and the *Channel* to *Stereo* (not *Joint Stereo*) – and finally click *OK*.



**4** Back on the main screen, click *New* in the *Job Queue* and select your new *MP3 profile* when prompted for a profile.



**5** On the next dialog, select the *WAV* file you created in the last tutorial and enter the location where you want the *MP3* file to be created. Click *Finish*.



**6** Your job will appear in the *Job queue*. Select it and hit *Encode*. *XingMPEG Encoder* then quickly encodes your file and saves it to the target directory.

### ON THE WEB

Now you've got your *MP3* player installed, it's time to hit the Net to look for some tunes. A great resource site for *MP3* is [www.mp3.com](http://www.mp3.com). Here, you'll find all the latest *MP3* news, software, links and music files to download.



### WARNING!

Remember that it's legal to encode *MP3s* from your own CDs and keep them to yourself, but it's illegal to encode *MP3s* and distribute them in any way, including on the Internet.

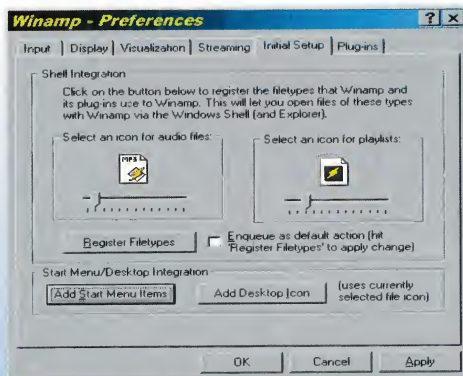
## Playing your MP3 track

To play *MP3* tracks you need to have, logically enough, an *MP3* player at your disposal – conventional media players don't support the standard. We're

going to use a very popular *MP3* player called *WinAmp*. You can use this shareware version for a period of up to 14 days.



**1** Install *WinAmp* from our menu. The first time you run it you'll see this dialog screen. Click *OK*.



**2** On the next screen, click the *Register File types* button and the *Add Start menu items* button. You'll only need to do this operation once. When you've done that, click *OK*.



**3** Hit the *Open* button (it looks like an eject button on a CD player). Locate the *MP3* file you just recorded on your hard drive, then hit the *Play* button. *Xing* gives its *MP3* file name an *MPA* extension by default, and unfortunately *WinAmp* looks for a file extension of *MP3*. So, you've got to select *All Files* from the file Types box to load in your *MPA* file.



# Choose your free

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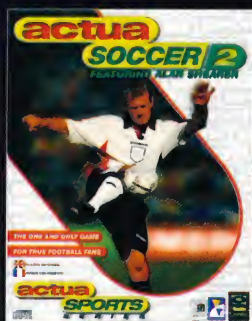


## F-22 AIR DOMINANCE FIGHTER

We recently gave this awesome jet fighter sim a mightily impressive nine out of ten in a review that couldn't help sing its praises. And with truly spectacular photo-realistic views it's no wonder. F-22 is the closest thing the PC has to a true military flight simulator.

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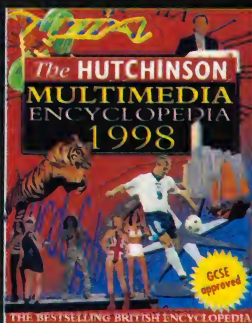


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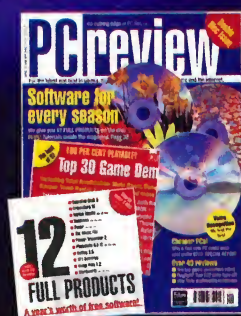
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# Q&A

TOP TIPS  
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Make your PC more efficient with our **Windows, DOS, hardware and Internet** hints – have your problems solved. **BY PAUL DIAS**

## On The Buses

**Q** I'm new to PCs but quite interested in hardware. I've been reading about Intel's new 100MHz buses. What are buses? I've read about front-side bus and back-side bus, as well as dual-bus graphics chips in your news last month. Presumably I don't need a bus pass to use these buses!

**Wyn Jones,  
Tredegar**

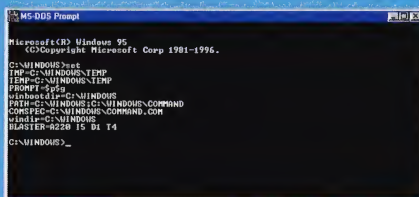
**A** A bus is essentially a communications pathway between different components of your PC. For example, the main system bus connects your Pentium processor to the main memory, PCI slots, hard disk controller and so on. When the CPU wants to access a value in memory, it sends out a request and receives the data back from memory over the bus. Similarly, to store data on your hard disks the CPU sends it out over the bus. You may also see the main system bus being described as a front-side bus, often when the CPU is being discussed. Recent Pentium processors have what's known as a back-side bus in addition to a connection to the front-side bus. The back-side bus is used solely for the CPU to exchange data with its fast level 2 cache memory.

A key measure of bus performance is clock frequency, measured in megahertz (MHz). The faster the clock, the faster data can be transferred using the bus. Up until recently, the maximum system bus speed was 66MHz (this is also referred to as the motherboard speed). This means that even if the CPU is running at 300MHz, its performance is limited by being forced to communicate over a bus running at 66MHz or slower. This was alleviated in part by running the back-side bus at a higher speed, so that the CPU would at least have faster access to the level

## WINDOWS TIP OF THE MONTH TEMPORARY TROUBLES

A common problem with Windows is running out of space in your temporary directories. By default, Windows 95 uses a directory called C:\Windows\Temp for storing temporary files. These are files created by programs needing to store temporarily. For example, most software installation programs decompress files into the temporary directory before copying them to their final location. This is what is happening when the ubiquitous *InstallShield* program is first starting up. When the hard disk with the Temp directory gets full, many programs start complaining.

The first solution to this is to clear the Temp directory. Don't remove a file that's in use by a program – it's best to close all your apps and restart Windows. If you have programs in your Startup folder, bypass these



above: Typing *Set* in an MS-DOS window enables you to see the current value of the *TEMP* and *TMP* environment variables.

by holding down Shift while Windows is starting. Go into the Windows\Temp directory and it's safe to delete all files. You may also have a C:\Temp directory, which can also be used for temporary storage – clear this out too. Freeing up space on the HD which holds the Temp directory makes more room too.

You can also relocate the temporary directory to another disk with more space. Set the environment variable TEMP so that it contains the name of the directory you want to use. First, you'll need to edit the file C:\Autoexec.bat. If this doesn't exist, create it using a Text editor like *Notepad*. Add a line that reads: temp=d:\temp and another reading: tmp=d:\temp. (Replace d:\temp with the name of your chosen temporary directory). Windows apps should read the value of the TEMP variable to decide where to put temporary files. Some apps always try and use C:\Windows\Temp, though.



above: For top speed computing, get a new 100MHz motherboard – you'll find these in the 350 and 400MHz Pentium II systems.

2 cache memory. The Pentium Pro runs its back-side bus at the same speed as the CPU, but the Pentium II runs it at only half the CPU clock speed.

The latest Pentium II processors from Intel, running at 350 and 400MHz, have a front-side bus speed of 100MHz. This is a significant improvement over the old 66MHz maximum, and is a good reason for investing in a 350MHz PII instead of a 333MHz, for example. This new motherboard speed means that, in theory, the whole PC is faster and not just the processor. The overall performance of a PC is determined by a number of factors, including processor speed, bus speed, hard disk and graphics card speed.

## How fast is DVD?

**Q** I am thinking about getting a new DVD-ROM drive, but I have a question about their speeds. It seems that we have started the speed numbering scheme again, with double speed DVD-ROM drives being the latest available. Surely this doesn't mean the drive is the speed of a double speed CD-ROM drive? Is it worth waiting for faster DVD-ROM drives to come out?

**Dave Springer,  
Rochester**

**A** For playing DVD discs, you have nothing to worry about. The original single-speed DVD-ROM drives actually spin the CD only a little faster than an old double speed CD-ROM drive. Because the data on a DVD disc is much more densely packed, however, the data transfer rate you get from it is equivalent to a nine speed drive, or about 1300KBps. Second generation DVD drives, also now known as double speed drives, spin the DVD disc twice as fast, and can thus attain a transfer rate of around 2600KBps. When reading old CD-ROMs, however, the DVD drives can behave differently.

## READERS TIP

### Extra Special Tip

With reference to the letter 'Extra Special Files' in May's Q&A, one of the best ways of safeguarding your system is to use Microsoft's *Emergency Recovery Utility*. It's free from [www.microsoft.com/windows95/info/otherutils.htm](http://www.microsoft.com/windows95/info/otherutils.htm). Once installed, you can run it at any time to archive special files: the defaults being Config.sys, Autoexec.bat, Win.ini, System.ini, Protocol.ini, User.dat, System.dat, Io.sys, Command.com and finally Msdos.sys. User.dat and System.dat are the Registry. It's also possible to add your own files to this list by editing Eru.ini. You can save the archive to floppy or to the hard drive. I run the utility prior to installing 'dodgy' software, and save to the hard disk. If the system becomes unstable or files are lost, I just boot the system with a Startup disk, CD to the ERU directory and run ERD file to restore the system.

**Chris Hollingworth, via email**





above: Double-speed DVD-ROM drives may not sound fast, but they're comparable to a 20 speed CD-ROM drive. Now that's what we call fast.

Some give reasonable performance, comparable to a 20 speed CD drive for example, but you should check the specifications of a DVD drive before buying one. As far as waiting for the next generation of DVD drive, that very much depends on your requirements. As you're probably aware, the amount of software available on DVD-ROM is somewhat limited at the moment. So unless you're keen to have the latest technology in your system today, you may find it worthwhile waiting to see how the software and hardware develops in the future. Faster drives are sure to come.

## Speeding Through The Registry

**Q** In your last issue, you showed me how to overclock my Monster 3D (3Dfx) card for Direct3D applications by altering an entry in the Windows 95 Registry using Regedit. I understand that controlling the Registry can be a powerful way of getting more from your machine. Can you explain to me the difference between String Values, Binary and D-Values, and which apply to which kinds of drivers or software?  
**David Henderson, Poole**

**A** The Windows 95 Registry is basically a centralised location for storing the settings of various customisable applications and other bits of software. The values that are stored in the Registry are entirely up to the applications concerned, and so will vary from program to program. In the case of the 3Dfx driver the Registry is used to hold details of the configuration of the card, including settings such as the chipset clock speed. That you can change the clock speed using the Registry is a combination of the fact that you can change the clock speed on the card through software, and that the software's settings are stored in the Registry. Different bits of hardware will be configurable in different ways, sometimes through software settings and sometimes through physically setting a switch or jumper on the hardware itself.

The Registry is quite flexible in that you can store different types of data in it. Each value has a 'name' and an associated bit of 'data'. There are three types of value that can be stored in the Registry: String,

## HARDWARE TIP OF THE MONTH

### SPEEDING UP CD'S

It seems that CD-ROM drives just keep getting faster and faster these days, but things are not always as they seem. As often happens in the PC world rating the performance of CD-ROM drives has been reduced to a single number: the 'x' speed rating. You would have thought that a 24x CD-ROM drive is 24 times faster than an old 1x drive, but it all depends on how you measure it. One of the most interesting factors to consider is the transfer rate. This measures how quickly data, be it video, audio or a game, is read from the CD, and then sent into your PC.

The original 1x drives could transfer data at 150KBps (kilobytes per second). This transfer rate was constant for the entire disc, so it didn't matter whether the data was coming from the innermost part of the CD or the outermost. A constant transfer rate is essential for playing audio CDs. To achieve this constant rate, CD drives use a technique called Constant Linear Velocity (CLV). In this system the rotation speed is varied depending on what part of the disc is being read. One revolution of the disc's innermost tracks contains far less data than one revolution of the outermost tracks, so to compensate the disc is spun quicker the closer to the centre of the disc you get. Up to around the 12x mark CD-ROM drives use CLV, and so a 12x drive has a transfer rate of 1800KBps.

Faster CD-ROM drives use a different rotation technique called Constant Angular Velocity (CAV). This means that the disc spins at a constant speed and so the data transfer rate varies. 24x speed CD-ROM drives only give 24x



above: A 24x CD-ROM drive may only give 24 times the speed for some of the time.

equivalent transfer rates on the outermost tracks of the disc. On the innermost tracks, they can give rates equivalent to a 12x CLV drive. This is why you often see such drives' speed rated as 12/24x. Some drives now also feature a combination of the CLV and CAV methods to give the best of both worlds. CLV is used for the inner tracks, so that the minimum transfer rate is increased.

Binary and DWORD. String values are simply text strings. Binary values are blocks of raw data, and DWORD values are single numbers (32-bits long). So, to hold your username, for example, the Registry uses a String value, but to hold the speed setting of your 3Dfx card, it might use a DWORD.

The only sure-fire way to know what Registry values are used by a particular bit of software is to get hold of some appropriate documentation for the software. Since this kind of information is generally beyond the scope of most users' requirements it can

## READERS TIP

### Swift Shutdown

Create a shortcut in Windows 95 (right-click on the desktop, choose New, then Shortcut). Under command line type: rundll32.exe user.dll, ExitWindows. Save to your desktop, double-click on it and it saves you going to the Start button and pressing Shutdown. Another one to try is: rundll32.exe kernel32.dll, FatalAppExitW. This sometimes quits Windows, but half the time it also results in some quite spectacular crashes!

**Andrew K Self, via email**

be quite hard to get hold of. You may be able to get this kind of information from the manufacturer of the piece of hardware concerned, or you may find it on the Web. For example, a couple of good pages devoted to 3Dfx cards are [www.op3dfx.com](http://www.op3dfx.com) and [www.voodooextreme.com](http://www.voodooextreme.com). If you're interested in tweaking other bits of hardware, then you'll have to start searching yourself.

## Ugly Uninstallations

**Q** My problem is with removing programs that don't appear in the Add/Remove Programs control panel. I am referring specifically to a Microsoft Entertainment Pack that I loaded onto my computer from an MS Demo Disc. Examining the various directories, I see that I have one title 'EP' which contains the various sections - Chess, Dr Blackjack, Fuji Golf, Jig Sawed and so on. My first thought was just to delete this directory, but then I discovered that, in the Windows folder, I also have the files Fujigolf.dat, Fujigolf.ini and Entpack.ini - which I presume would also have to be deleted (as would 'Custom Ent Pack' from my Start directory). Have I covered everything or could there be other files that I've missed? Also, are these actions safe?

In the same vein, I don't want either MS Hearts or Minesweeper although I do want Solitaire and Freecell. Can I solve this by removing Winnine.exe, Winnine.ini and MSHearts.exe from my Windows directory (I can't find an MSHearts.ini - should there be one?).  
**Alan King, Marchwiel**

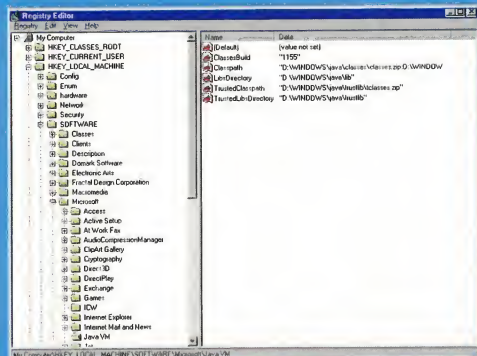
**A** This is one of the big problems with Windows programs - they don't simply install all their files in a single easily-identifiable directory. Mostly, you'll find programs placing files in the Windows and Windows\System directories, along with new entries in the Registry and the Start Menu.

If you're worried about wasting disk space, then you can probably get away with just removing the main directory for the program concerned. The files installed in the Windows directory are generally going to be fairly small. The big risk in deleting things from the Windows folder is that you accidentally remove something that's needed by another program. In cases where it's obvious which program the files are associated with (as in the examples you give), it's safe to delete them.

It's almost impossible to be sure that you remove all the files installed by a program, however, because some have names that are completely unrelated. In such cases, it's safer just to leave the contents of the Windows directory alone. If you're lucky you may find a .INF file somewhere in the program's directory that lists which files were installed. You should be aware that sometimes installers update versions of existing Windows system files (a practice which is soon to be discouraged by Microsoft) - so don't delete them.

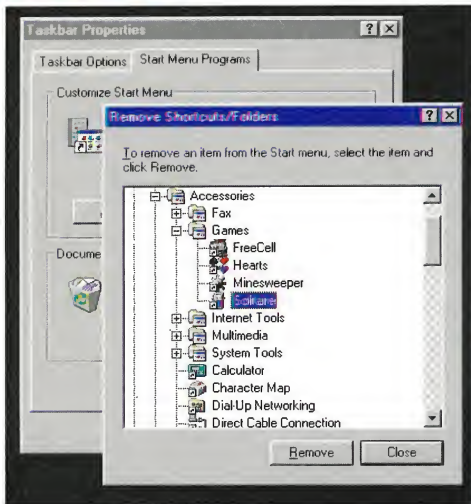
You should be able to easily remove any extraneous Start Menu items by going to the Settings part of the Start Menu, choosing Taskbar and then going to the Start Menu tab. The Registry

continued over



above: Modifying the Windows 95 Registry can be a way to speed up your hardware. Finding out which bits to tweak is not easy, though.





left: Removing unwanted Windows Start Menu entries with the Taskbar settings control panel.

is another tricky problem, however, and is probably best left well alone. Altering Registry entries without knowing exactly what you're doing is a sure-fire way to introduce new problems to your system. The Windows games you mention should be safe to remove in the way that you describe, though you'll probably want to remove their Start Menu entries too. Again, though, you should consider how much space you're really gaining by deleting them.

### Scantastic Colour

These new scanners scan images at 30-bits, with 10-bits of data per colour for red, green and blue. However, the images are stored in 24-bit colour. If 30-bits of data are recorded, where are those extra 6-bits going when the images are stored? How does it work?

**Adrian Quinn  
Stockport**

The difference between 10-bits per colour and 8-bits per colour is essentially the number of different brightness levels that can be captured. Increasing the number of bits per colour gives the scanner a greater ability to capture subtle details in the original image, such as those found in shadows or dark areas.

As you correctly point out, most graphics software only handles images that are up to 24-bit colour, but the software that comes with 30-bit scanners handles 30-bit images correctly.

When saving the scan as a 24-bit colour image, the scanner software performs a conversion from 30 to 24-bits. Because there are more bits available than are needed in the final image, the software is able to use the additional information to produce a better-looking 24-bit image than would have come from a 24-bit scanner. It can also attempt to correct for poor quality scans or other problems that may have occurred. Having 30-bits to play with also gives you greater flexibility when adjusting the image's brightness, contrast and colour balance before saving

right: 30-bit scanners can produce better 24-bit colour images than plain old 24-bit scanners do.



as a 24-bit file. You must use the software provided with the scanner in order to make the most of the 30-bits that are available.

### What's It All About?

I recently acquired a cheap internal 28.8 modem for my PC. It's an ISA card and I have installed it in one of the free slots in my system. There are a number of little switches on the back of the card for settings, which COM port the modem will be on, but the manual also has warnings about choosing a free IRQ number for the modem to use. It's not very clear on how I am supposed to do this, however. Can you tell me what it's all about?

**Chris Pilkington,  
Slough**

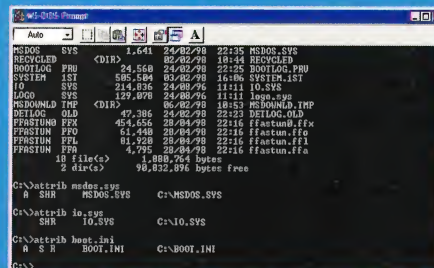
An IRQ, or interrupt request, is a mechanism that enables hardware devices to send signals to the processor. These are generally used by devices that perform some kind of I/O (Input/Output) operations, like mice, keyboards, printers and modems. The evolution of the PC has, for various reasons, led to there being a limited number of IRQs available, which in turn limits the number of devices you can have attached. There are 16IRQ lines, numbered from 0 to 15, which may sound like a lot but they quickly get used up. For example, a typical PC will have IRQs for the keyboard, two serial ports, a sound card, the floppy disk controller, a parallel port, two IDE channels, a mouse, a video card and a few reserved for internal system use. This leaves you with maybe three or four free IRQs to juggle between any other devices that you've installed.

The COM port situation is usually as follows: COM1 is allocated to IRQ 4 and COM2 uses IRQ3. Thus, if you have two serial ports on your machine, you either have to find another unused IRQ or disable one of your serial ports. Modem cards are usually configured so that they appear on your system as COM3 or COM4, which don't usually physically exist. Even so, the port used by the modem must be given an IRQ. You can use the Windows 95 System control panel to determine which IRQs are free, or the MS-DOS Msd.exe program. In the System control

## DOS TIP OF THE MONTH FILE ATTRIBUTES

The FAT file system, as used by MS-DOS and Windows 95, associates four optional attributes with every file stored on disk. The archive attribute (a) is generally used by back-up programs as a way of indicating which files need to be backed up. The archive attribute has no effect on the file itself. The read-only attribute (r) is for preventing a file from being changed or deleted.

If the read-only attribute has been set on a file, then you're able to look at its contents but you can't change it. The hidden attribute (h) stops the file appearing in a normal MS-DOS directory listing or Windows 95 directory window – but the file is still accessible if you happen to know its name. The hidden attribute is often used to hide important files from the user, to prevent accidental modification or



*The Attrib command is the key to handling file attributes – use it followed by the filename.*

deletion. The system attribute (s) is also used to designate system files, and as with hidden files system files does not show up in directory lists. The MS-DOS Io.sys and Msdos.sys files are generally tagged as being read-only, system, and for good measure, hidden.

From the DOS command prompt you can control file attributes with the Attrib command. To view the attributes of a particular file simply use Attrib followed by the filename. The attributes are displayed using the letter a, r, h and s. To change the attributes of a file, you need to use the + and - parameters to the Attrib command.

So, this means that if you want to make a file read-only you would use: Attrib +r myfile.txt. To make a hidden file visible use: Attrib -h hidden.doc. The Dir command has an option to display hidden files. For example, use Dir /a to show all the files in a directory, or Dir /a:h to show just hidden files.

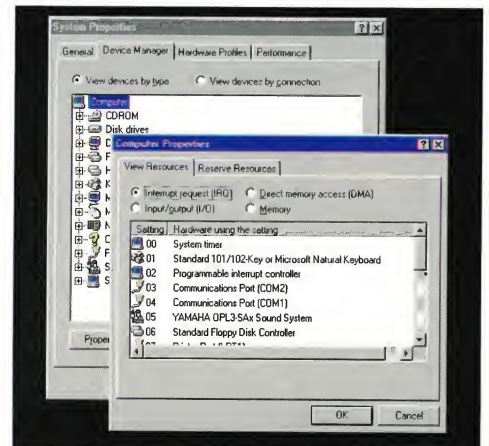
In Windows 95 you can modify file attributes simply by bringing up the Properties window for a file. (To do this, you need to right-click, and after that choose Properties from the pop-up menu). You can then set the attributes by using the four check boxes which you can see positioned at the bottom of the window. Then, if you want to view hidden files, choose Options from the View menu and follow this up by selecting Show All Files.

## READERS TIP

### Smart Swap

A key performance factor in Windows 95 is the swap file used for Virtual Memory. This is the process where some of your hard disk space is used as though it were physical RAM. Under normal circumstances, Windows uses your C: drive for its swap file (the actual file is called WIN386.SWP, and is normally hidden). I recently found that my C: drive was pretty full and so Windows couldn't expand the swap file as much as it needed to. You can relocate the swap file using the System control panel, however. Click on the Performance tab and then click the Virtual Memory button. You can then choose to locate the swap file on a drive with more free space.

**Len Watson,  
Portsmouth**



above: The Windows 95 System control panel enables you to see where all your IRQs are being used.



the "Computer" node at the top of the tree. You then get a new dialog box listing the used IRQ lines. If you aren't using both your serial ports, then you could opt for disabling one of them using your PC's BIOS set-up program, and then getting the modem card to take its place. Your modem's manual should tell you which settings to set the switches to so that it uses a given COM port and IRQ line.

## The Real 56K

**Q** I recently bought a new PC that came with a US Robotics x2 modem card installed. I recently read about the new 56Kbps standard that is not compatible with my x2 modem. Is there any way to change my modem so that it matches the new standard, and is there any point in doing this, anyway?

Jeremy Harrington,  
London

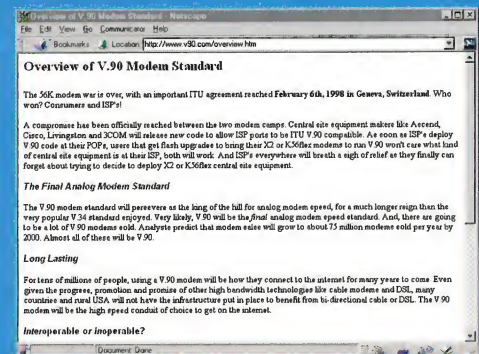
**A** The new 56Kbps modem standard, known as V.90, was introduced to replace the two competing standards, x2 and K56Flex. Having two standards made it very difficult for consumers and service providers to decide which to choose. This caused a lot of unnecessary confusion, and so the decision to come up with a new standard that incorporates the best features of both systems is clearly a sensible move. The International Telecommunications Union, the body responsible for setting modem standards, is set to officially ratify the V.90 standard in September. A draft specification has been released, to enable modem manufacturers to start developing compatible products. Once V.90 replaces x2 and K56Flex, modems from all manufacturers should be able to communicate with others, and ISPs will only have to support a single 56Kbps system. The new standard does not offer any speed improvements over the previous two, and technical limitations still mean that the fastest speeds you'll be able to get are 56Kbps for downloading, and 33Kbps for uploading.

However, this does mean that if you bought one of the two earlier types of modem, you're left with a bit of a problem – as you have discovered. Fortunately, though, common sense is likely to blossom forth, and US Robotics has already launched a range of modems that support both V.90 and x2 – and you can be sure that other manufacturers will do the same. In addition, upgrades will be made available for owners of existing x2 modems. These may take the form of a hardware chip upgrade, or a simply software flash upgrade. You should check with your PC vendor about the availability of this upgrade for your particular modem.

At the moment, there's no great advantage in upgrading to the V.90 standard, though, because initial support for it from ISPs will be limited. Estimates put the time scales for ISP support towards the latter part of 1998, but if your ISP currently support x2, then you can stick with that for the time being. Eventually, of course, all ISPs will switch over to offer support for V.90, and so then you should upgrade your modem.

## Office Corruption

**Q** As you seem to be the magazine with all the answers, I wonder if you can help me with a problem I have been encountering with Word in Office 95. If I have a block of text I

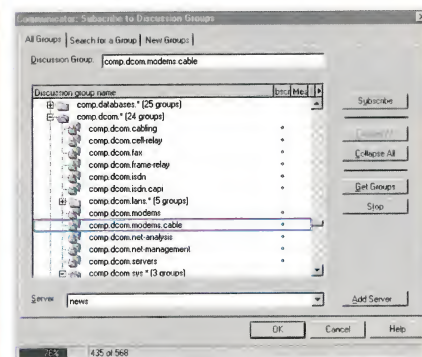


above: [www.v90.com](http://www.v90.com) is a Web site devoted to the new V.90 56Kbps modem standard. Check it out.

## INTERNET TIP OF THE MONTH

The World Wide Web is probably the best known application of the Internet. It receives the most media coverage and is often confused with the Internet itself. There are, of course, many other things you can do with the Internet – good old electronic mail is one example. An often neglected use of the Internet are the Usenet newsgroups or, as they are often called nowadays, Internet Discussion Groups. These newsgroups are essentially public message boards where the messages take the form of text messages linked together into 'threads' by having a common 'Subject' line. You can choose to simply watch the threads in a newsgroup as they unfold, or participate by posting your own messages.

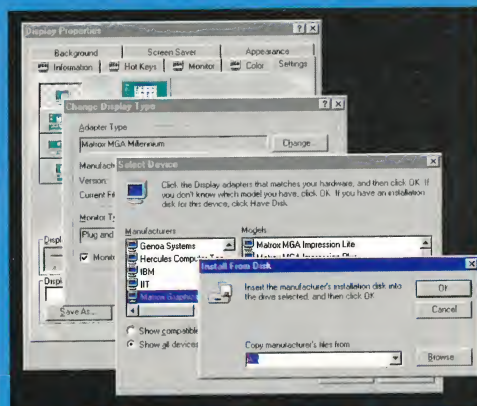
There are thousands of different newsgroups available – recent estimates put the number at over 15,000 – covering a vast array of subjects. In order to try and make things more manageable, the newsgroups have been arranged into several tree-like hierarchies. This structure is reflected in the names of the groups. For example, newsgroups starting with 'comp' are part of the computer-related hierarchy, below which you can find further groups such as 'comp.programming', 'comp.graphics' and 'comp.sys'. At the bottom of the tree, you'll



above: Here's Netscape Communicator showing the tree of Internet Discussion Groups. With 15,000 to choose from, you can get help or information on almost any subject.

find individual newsgroups, such as 'comp.sys.ibm.pc.games.action', a discussion group about PC action games. A newsreader such as the one in Netscape Communicator or Microsoft Internet Explorer enables you to browse the tree of groups or search for group names containing particular words.

Once you've found a group that you want to have a look at, you 'subscribe' to it – which essentially means you add it to your newsreader's list of groups that you're interested in. You're then able to look at the list of threads in the group and check out what's going on. Remember, though, that subscribing simply means that your newsreader collects the messages for the group. Your name or email address are not added to a list of subscribers, since no such list exists. When you decide to add to the discussion you should configure your newsreader to use the name or email address you want to use.



above: The Display control panel is the place to start looking if you decide that you want to update your display driver software.

have typed and then go back and add a word into it, the line I add the word to becomes distorted, losing the entire top portion of it. This also happens if I use a large font and simply go on to another line – then the previous line becomes illegible. The only way to rectify the problem is to go to Print Preview and then return to the document. I have also tried updating my office package to Office 97. This did not fix the problem. I have Norton Utilities installed, including Virus Check, and have thoroughly checked my system and it all seems to be fine.

Natalie Wilson,  
via email

**A** This sounds like some kind of problem with your video card drivers. Microsoft's support Web site (<http://support.microsoft.com>) lists a number of known video driver issues. Video corruption, such as you're seeing, is mentioned in association with video cards or chipsets from Hercules (www.hercules.com), STB (www.stb.com) and Tseng Labs (www.tseng.com). If you have one of these cards, then you should check that you're using the latest version of the driver software, or download the latest version from the appropriate Web site. In fact, even if your card is not one of the ones specifically mentioned, you should check to see if a new version is available. You may need to contact your PC manufacturer or the graphics card manufacturer directly to find this out.

You should find that the instructions for installing the driver are included in the file that you download from the Internet, but the basic procedure for doing this is as follows.

First off, go to the Control Panel folder and double-click the Display icon. Go to the Settings tab, and click the 'Change Display Type' or 'Advanced Properties' button. This then shows you the name and model of your current video driver – useful if you didn't already know what kind of card you have. Click the Change button to update the driver, using the 'Have Disk' button to point Windows at the directory containing the new driver that you downloaded. **PCB**

## READERS TIP

### Tree Space

A useful feature of Windows 95 is to be able to work out the total size of all the files held within a particular folder, including all the files in sub-folders of the folder in question. My Macintosh friends have an option that enables this figure to be calculated and displayed automatically, but you have to work a bit harder in Windows 95 (as usual). Find the folder you want to get the total size of, right-click it and pick Properties from the pop-up menu. You'll see the Size figure increase as the total size is calculated. When it stops changing, that's the grand total. In addition, the Contains section shows you how many files and folders are contained in the folder you clicked on.

Emma Jones,  
via email



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## CD REVIEW

Bringing you the best games and multimedia demos plus all the finest utilities and creative packages

# Games

A PC Review CD without games would be like a cake without the icing. Go on, have a slice.

## OUTWARS

We loved this game so much that last issue we gave it a whopping eight out of ten. This issue we're bringing you the fully playable demo.

Leading a team of Dreadnought Marines it's your job to blast the bugs out of the galaxy. *Outwars* passes more than a nodding glance towards the fantastic *Starship Troopers*, especially in the battle sequences. Elsewhere in the game you're going to need to use a bit of strategy to overcome your adversary. It's important not to rush into each level blasting everything in sight. Try and make use of what cover there is available and pick off the bugs using long range weapons.

This demo puts you straight into the heart of the action. You have two single player missions to accomplish. Use the mouse and arrow keys to move around and the number keys to select different weapons.

From: Microsoft

Contact: 0345 002000

Limitation: Two missions

Requires: P133, 16MB RAM, DirectX, Windows 95



above: Under an orange sky you are the bug killer in *Outwars*.

right: Here's the impressive array of troops at your disposal in the demo of *Armor Command*.



## ON THE DISC!

All these top-notch treats can be found on the free on the CD Review disc. Load them up!



## WORLD LEAGUE SOCCER 98

Once again the World Cup is upon us and the expected deluge of soccer games has begun in earnest. All of a sudden it's impossible to move around the office safely for fear of falling over boxes of World Cup games stacked knee high. EIDOS enters the fray with *World League Soccer 98*.

This demo features a match between Brazil, the mighty giants of World Cup soccer, and the enthusiastic underdogs, Scotland. If you are ever stuck for a key to press to move the action forward, for example when you need to toss the coin, try the 0 key. Commentary provided by *Football Italia's* Peter Brackley and the ever genial Ray Wilkins.

From: EIDOS

Contact: 0181 636 3000

Limitation: One match between Brazil and Scotland

Requires: Pentium, 16MB RAM, DirectX, Windows 95

## JAZZ JACKRABBIT 2

Here's the sequel to the phenomenally successful shareware game *Jazz Jackrabbit*. The original game was a huge hit on the PC, and the sequel looks set repeat its success. Bearing more than a passing resemblance to a certain hedgehog owned by SEGA, Jazz



above: Okay, we came last in *Rally Championship*, but at least we tried.

has to work his way from left to right through each level. Watch out for the jump key [Control] because when this bunny jumps he really launches himself into orbit! Press the fire key [Space] to despatch nasties along the way, and remember to collect all the treasures you see to get enough warp points to make it to the next level.

From: Anglia Multimedia

Contact: 01603 615151

www.jazzjackrabbit.com

Limitation: Shareware levels

Requires: Pentium 90, 16MB RAM, DirectX, Windows 95

## ARMOR COMMAND

*Armor Command* puts you in charge of a command station on a rainy, and none too friendly alien world. The locals are obviously not too impressed with your presence because they seem to be doing everything possible to get you to leave. While keeping them at bay with one hand you have to mine the planet's surface for minerals and explore with the other. Use the arrow keys to cycle

through your vehicles, and the mouse to command them. This demo not only looks gorgeous but plays like a dream, even on processors below 200 MHz.

From: Take 2 Interactive

Contact: 01753 854444

Limitation: One fully playable mission

Requires: P90 with 3D card or P166, 16MB RAM, Direct X, Windows 95

## INTERNATIONAL RALLY CHAMPIONSHIP

Despite having the same three letter acronym as Internet Relay Chat, *IRC* is in fact a top-notch racing game. Packed with fantastic FMV sequences this is the sequel to last year's *RAC Rally Championship*. As you career round the track your co-driver shouts out warnings like 'Hard right' or 'Easy left' as corners loom. As you'll find out, it's very easy to skid. This adds to the overall fun as your car swerves, spins or rolls. Judging by his sarcastic comments your co-driver doesn't think much of such behaviour, so take it easy, if only for his sake please.



above: Get in a Monster Truck and drive. With wheels this big it must be fun.



From: Europress  
Contact: 01625 859333  
Limitation: One track, one car.  
Requires: Pentium, 16MB RAM, DirectX,  
Windows 95

## MONSTER TRUCK MADNESS 2

This isn't ordinary madness. This is madness in monster trucks, and at PC Review that's the sort of madness we like. *Monster Truck Madness 2* features a brand spanking new 3D engine and better tracks than the original. Unlike other racing games *MTM2* doesn't confine you to the track. If you can see a quicker way to make your time check points by driving over the verge then just go for it! Anything that stands in your way can be crushed by your massive tyres. Now this is what we call fun! This demo will install DirectX 5.2, which you need before you can play.

From: Microsoft  
Contact: 0345 002000  
Limitation: One track  
Requires: Pentium 133, 16MB RAM,  
DirectX 5.2, Windows 95.

## INDUSTRY GIANT

Inside even the most lily-livered liberal there's a screaming capitalist doing its best to burst out. If you fit the bill then now you can let your ambitions run riot in safety with *Industry Giant* from Interactive Magic. Best known for its aircraft simulations the company is

expanding into all areas these days. In *Industry Giant* your task is to build an empire in a virgin world that's prime for exploitation. Make sure you poison the land, build lots of nuclear power stations next to family dwellings and chop down as many trees as you can to get the PC Review award for ethics.

From: Interactive Magic  
Contact: 01344 409 399  
Limitation: One world.  
Requires: Pentium, 16MB RAM,  
Windows 95.

## CASTROL HONDA - SUPERBIKE WORLD CHAMPIONSHIP

This is a game for the real bike enthusiasts. Officially licensed and developed with the 1997 World Champions, *Castrol Honda Superbike* is not just a game, it's an accurate motorbike simulation that's so real you can almost smell the exhaust fumes. If you're looking for an arcade racer then you'd be better off elsewhere, but if you want the real thing then look no farther. Every aspect of the 190 Mph, 160 Bhp, Honda RVF-RC45 has been simulated and reproduced to meet exact specifications. This demo features one track, and requires a joystick to work properly. The race starts automatically, and when it ends the game quits.

From: Intense Entertainment  
Contact: www.intense-games.com  
Limitation: One track, Joystick only



above: Get behind the wheel of a Honda in *Superbike World Champions*.

Requires: P90, 16MB RAM, DirectX 5,  
Joystick, Windows 95.

## TIE BREAK TENNIS

With Wimbledon on the way it's time to warm up your back-hand with *Tie Break Tennis* from Hammer Technologies. This is a good old DOS demo, although it seems to work quite happily from within Windows 95. Once installed change to the new *Tiebreak* folder and run the file *Tiebreak.exe*. Run the *Setup.exe* to set up your sound and graphic cards for the game. Use the arrow keys to move and the [Ctrl] to hit the ball and serve. The only thing missing is the strawberries and cream.

From: Hammer Technologies  
Contact: +34 13040622  
Limitation: Single match  
Requires: P100, 16MB RAM, Windows 95.

## ADDICTION PINBALL

*Addiction Pinball* has been developed from Team 17, the chaps behind *Worms*. This time they've taken a break from bombing helpless pink wiggly things and turned their attentions towards the noble art of pinball. However, as you can see from the table design, *Worms* are still a big part of their life. Apparently there are lots of trick features to discover on each table, including some mini-games. This limited demo features just one table. Use the left and right Shift keys for the flippers, and Space to jolt the table. The Return key launches the ball. Be careful not to tilt your monitor.

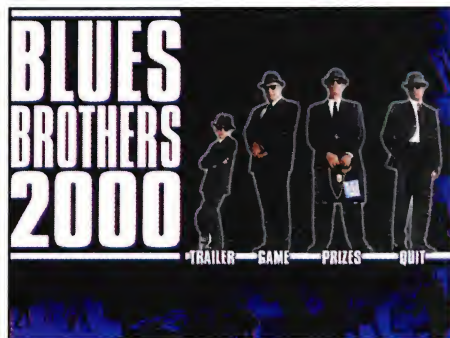
From: Microprose  
Contact: 01454 893893  
Limitation: One table  
Requires: 486, 8MB RAM, Windows 95

# Multimedia

right: You can have football pie every day of the year with *Football365*.



below: It's dark and they're wearing sunglasses.



## FOOTBALL365

These guys must be football crazy! Not only do they run their own Web site and newsletter dedicated to football, but they also want to give you readers the chance to win World Cup tickets simply by registering for free on their site. Both the Web site and newsletter are entirely free of charge and packed with the latest football news.

This special multimedia CD-ROM sampler aims to promote *Football365* by giving you a stack of interesting facts in the run-up to the World Cup. Be amazed by how many goals Holland let

in 1939, be astounded at the player who was given two yellow cards and not sent off, and finally gasp in disbelief at the number of Brazilian players with only three letters in their name.

Remember this interactive demo is just a taster of what you can find on the

*Football365* Web site and newsletter.

Register today!  
From: *Football365*  
Contact: www.football365.co.uk  
Limitation: None  
Requires: Pentium, 16MB RAM,  
Windows 95

## BLUES BROTHERS 2000

Despite John Belushi being dead The Blues Brother's are getting the band back together one more time. In this interactive sampler you can watch a full screen video trailer for the movie, play a Blues Brother's game or compete for

## Plug-ins

Install these plug-ins to considerably enhance your Web browsing experience.

### Shockwave

Many top Web sites boast animation and interactive games that you can view with *Shockwave*. Check it out at Macromedia's Shockwave site (www.shockwave.com)

From: Macromedia  
www.macromedia.com

### RealPlayer 5

Real Networks' sound streaming application enables you to listen to live music and speech at AM radio quality in stereo, or FM quality in mono. There are versions for Windows 3.1 and 95.

From: Real Networks

www.real.com

### Viscape 5.11

Viscape is a browser for exploring high quality 3D worlds on the Web. It's by Superscape and runs under Windows 95 only.

From: Superscape

www.superscape.com

### Microsoft Media Player

The Microsoft Media Player plays every media file format known to mankind, all from within the confines of your Web Browser. This product is still in Beta test, so we cannot guarantee that it will work correctly with your system.

From: Microsoft  
www.microsoft.com

some Blues Brother's prizes. In the game you have to find the other band members before the Cops catch up with you and you go straight to jail. Also on offer in this sampler are movie trailers of the films *Deep Impact*, *Mercury Rising* and *Mouse Trap*.

From: ICV

Contact: 0171 486 5558

Limitation: None

Requires: Pentium, 16 MB, Windows 3.1/95

## RAILPLANNER

You'll never need to bother your local station again for train times again. Now you can make the most of your PC with *RailPlanner*. This great piece of software contains train timetables for the entire country. During the install you'll be asked for an access code. Type

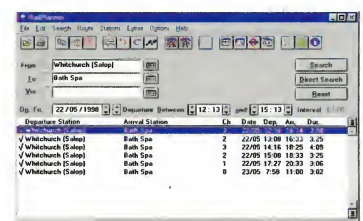
the following code exactly as shown: XHPM-FYHX to get the software up and running.

From: RailPlanner

Contact: 0181 466 4646

Limitation: None

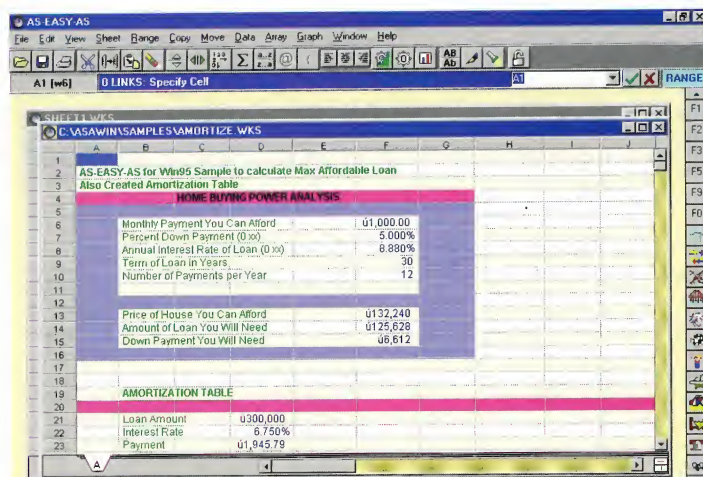
Requires: 486, 8MB RAM, Windows 95



above: Forget phone calls to *RailTrack* now you've got *Rail Planner* you can save on those phone bills.



# The Works



above: *As Easy As* can take care of all your spreadsheet needs.

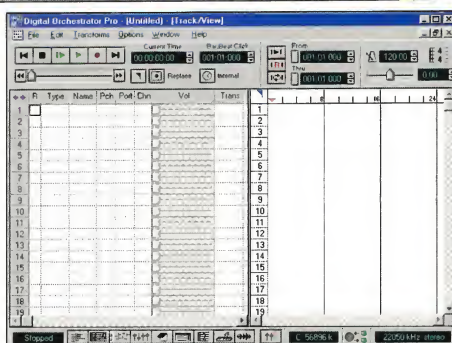
## AS EASY AS

For about £40, *As Easy As* is a powerful 32-bit spreadsheet that won't break the bank. It has over 130 functions available and its own macro-programming language. It also features colour printing, password protection, text search and replace and file linking. As its name suggests it is very straightforward to use and it's almost as good as the more established brand names, but at a fraction of their price.

To evaluate this shareware version you need to enter the code 98989 during the installation process. If you decide to purchase it then you'll be given a different code. Until then you have 30 days to go spreadsheet crazy.  
**From:** Atlantic Coast  
**Contact:** 01297 552020  
**Limitation:** 30-day shareware  
**Requires:** 486, 8MB RAM, Windows 95

## CD COPY

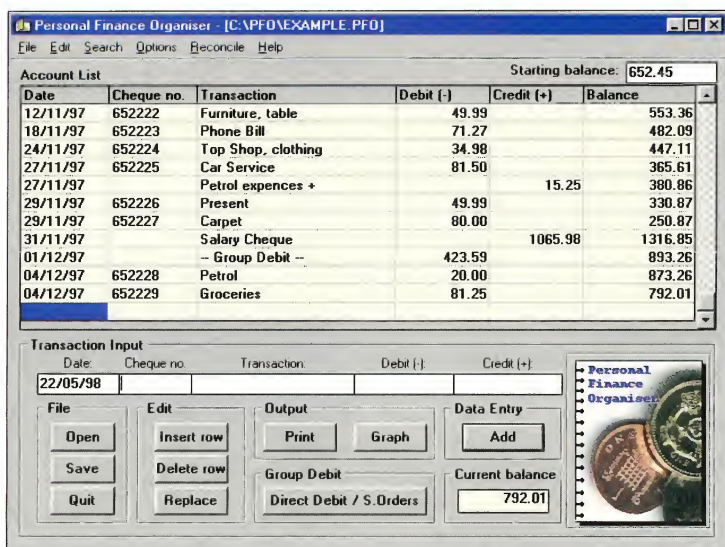
This program rips tracks straight off a CD and converts them into WAV files.



above: *Sequence, edit and record music with Digital Orchestrator Pro.*

If you register this version then you also get the option of writing the WAV files to a CD Cutter. The program works with SCSI or ATAPI-CDROM drives only. Simply pop an audio CD into the drive and a list of tracks will appear in the *CD Copy* window. Select the track you want to convert and hit the copy icon on the tool bar. Remember that WAV files can be very large, so your hard drive is likely to fill up fast if you make a lot of them. Type \*.WAV into the Find dialog in Windows 95 to see how much space they are taking up on your drive.

**From:** Markus Barth  
**Contact:** www.cdcopy.sk



above: *Keep your bank manager relatively happy by showing him how well you look after your finances using Personal Finance.*

**Limitation:** No CD Recorder option.  
**Requires:** 486, 8MB RAM, SCSI or ATAPI-CD drive, Windows 95

## DIGITAL ORCHESTRATOR PRO

*Digital Orchestrator Pro* contains a MIDI sequencer, digital audio editor equalisers and much more. It's the sequel to *Digital Orchestrator Plus*, one of the best digital audio sequencers of 1997. In addition to feature enhancements, a new toolbar interface provides even more control to enhance the creative process.

As a digital audio editor, *Digital Orchestrator Pro* lets you create multi-track recordings from external audio sources. Digital audio and MIDI tracks exist side by side in perfect sync making song editing a synch. One session will make you a believer. Just follow the Quick Tour in the Help file to get started.

**From:** Voyetra technologies  
**Contact:** 01706 226039  
**Limitation:** No Save and program quits after 30 minutes.  
**Requires:** Pentium, 16MB RAM, Windows 95

## LYCOS

A special version of *Internet Explorer 4*, which contains enhanced tools from Lycos. Before you install *Internet Explorer 4.0*, you should make sure that no scheduled tasks are running, because they might interfere with the Setup process. Also, you must uninstall *Internet Explorer 4.0* first if a previous version is already on your system. Don't install the Active Desktop just yet. It's better to wait until the Department of Justice allow Microsoft to release Windows 98 before you convert your desktop into a Web page.

**From:** Lycos  
**Contact:** www-uk.lycos.com  
**Limitation:** None  
**Requires:** 486, 16MB RAM, Windows 95

## MACRO SCHEDULER

Macro Scheduler is an automation utility for Windows 95 and NT which allows macros to be built, recorded and scheduled to control applications and commands. When Macro Scheduler starts it places an icon in the system tray next to the clock. To invoke the main Macro Scheduler window double click on this icon. Alternatively, it's possible to right click on the icon and then select Settings from the pop up menu. You're then free to create macros of any Windows operations.  
**From:** Atlantic Coast  
**Contact:** 01297 552020  
**Limitation:** 30 day shareware  
**Requires:** 486, 8MB RAM, Windows 95

## PERSONAL FINANCE

Keep track of your bank or building society accounts with this handy piece of software all the way from Northern Ireland. When you set up an account for the first time it is necessary to enter a starting balance. The Organisers screen is split into two areas. The Account List, in the upper part of the screen, contains the details of all transactions. The Transaction Input, in the lower part of the screen is where all transaction details are entered and any

amendments made. To enter the first transaction click the mouse cursor on one of the Transaction input boxes, in the lower half of the screen.

**From:** DML Software  
**Contact:** liskd.skynet@dnnet.co.uk  
**Limitation:** Shareware  
**Requires:** 486, 8MB RAM, Windows 95.

## PHOTO VISTA

Using this software you can create 360 degree panoramas which can be navigated in real time. With *PhotoVista*, you can stitch a series of digital images into seamless panoramas that can be used in Web pages and virtual reality files, as well as for high-end photography and CD ROM content. It produces extremely compact, high-quality images optimised for immersive Web content. Once you create panoramas, you can also use them with the *RealSpace* Screen Saver, which is installed during a typical *PhotoVista* installation. The Help file contains a Quick-Start tutorial to get you going.  
**From:** Live Picture  
**Contact:** www.livepicture.com  
**Limitation:** Save-disabled  
**Requires:** 486, 16MB RAM, Windows 95.



above: *Create a web ready, 360 degree panoramic view of this house using Photo Vista.*

## QUICK VIEW PLUS 4.5

*Quick View Plus 4.5* is a powerful viewing utility which opens almost any file format and previews its contents. Once you've installed *Quick View Plus* simply right-click on any file in *Explorer* and choose the new *Quick View Plus* option from the menu. In addition to over 200 formats already supported, this version of *Quick View Plus* supports the very latest formats including Microsoft Word 97, Microsoft Excel 97, *Freelance 97* and *Lotus 1-2-3 97*. *Quick View Plus* already works with many programs, but now you can use it to view e-mail attachments in either *Eudora* or Microsoft *Outlook*. Try it out for 30 days, then make your mind up.  
**From:** Inso  
**Contact:** 0181 9471122  
**Limitation:** 30 Day trial  
**Requires:** 486, 8MB RAM, Windows 95



above: *Quite simply, rock the entire Net with WinAmp, the MP3 player.*



**WINAMP 1.9**

The Net is full of MP3 music files, but before you can listen to them you'll need an MP3 player. *WinAmp* is one of the best. It occupies very little desktop space and can handle a variety of audio file formats. The first time it loads you need to register the file types on your system and add desktop icons. You only need to do this the first time it loads.

Using the on-screen controls you can change the volume and balance of the file you are listening to, open a graphic equaliser and set up a play list. Hit the Eject button to open a new file using *WinAmp*.

From: Nullsoft

Contact: [www.winamp.com](http://www.winamp.com)

Limitation: Shareware

Requires: 486, 8MB RAM, Windows 95

**XINGMPEG ENCODER**

This great application turns audio WAV files into MPEG Audio layer 3 files (called MP3 files for short). MP3 files take a lot less space on your hard drive than WAV files, so it's a convenient method of storage. You can use *WinAmp*, also included on our CD to

play back the files you've convert. See the Tutorial in the Works section this month for details on using *XingMPEG Encoder*. Since this is the shareware version you are limited to encoding up to 30 seconds of music.

From: Xing Technologies

Contact: [www.xingtech.com](http://www.xingtech.com)

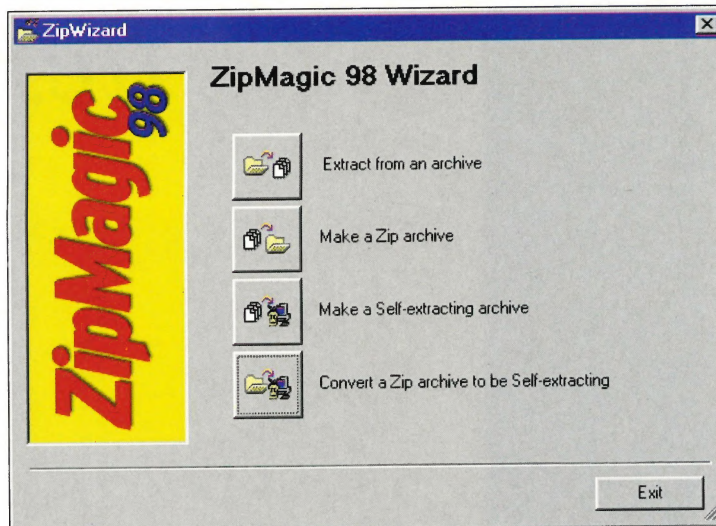
Limitation: 30 second limit

Requires: Pentium, 8MB RAM, Windows 95.

**ZIP MAGIC**

Make your compressed files act like windows folders, and even extract individual elements from zip files on the Internet using *Zip Magic*. The installation process is quite crucial to the way *Zip Magic* functions, so don't just hit the Next button without reading what you're about to agree to. You can set up *Zip Magic* to be the default zip program by setting File Associations and add *Zip Magic* to right mouse click Context menus.

You can also configure the versatile *Zip Magic* to work as an email plug-in. This will add Zip functionality directly into your email programs. You can then



above: The Zip Wizard makes creating Zip archives a breeze with Zip Wizard.

zip and attach a file to an email in one easy step. Browser plug-ins are also available for looking directly into Zip files on the Web.

From: Atlantic Coast

Contact: 01297 552020

Limitation: Shareware

Requires: 486, 8MB RAM, Windows 95

# Essentials

This is the section of CD Review where we put all those utilities that you shouldn't, or couldn't, be without.

**INTERNET EXPLORER 4**

Microsoft's Web browser is almost standard on many new PCs sold today. If you're not using it now, you soon will be as it's built into the heart of Windows 98. When installing *IE4*, we recommend you don't choose the Active Desktop option. It changes the way your desktop works and has caused some people's systems to crash.

From: Microsoft

[www.microsoft.com](http://www.microsoft.com)

**NETSCAPE COMMUNICATOR**

Netscape has now joined Microsoft in giving away its Web browser for free. *Communicator* is a suite of applications catering for all your Internet needs. It

unites email, newsgroups and Web browsing in one unified package. This is the latest version 4.04, which includes fixes to the bugs and security problems that afflicted previous versions.

[www.netscape.com](http://www.netscape.com)

**QUICKTIME FOR WINDOWS**

Many multimedia and Internet presentations require Apple's QuickTime for Windows. We've included 16- and 32-bit versions for Windows 3.1 and 95 users respectively.

**DIRECTX**

You need DirectX to play many of the games on CD Review. We recommend you install it if you haven't done so already. Both DirectX 3 and the newer DirectX 5 are included.

**MICROSOFT POWER TOYS**

A series of small programs that enable you to fine tune Windows 95.

**MICROSOFT REGCLEAN**

Applications that have not been properly uninstalled leave traces in your System Registry. Run *Regclean* to scrub them away.

**PAINT SHOP PRO**

For Windows 3.1 users we've included *Paint Shop Pro* version 3.11, while Windows 95 users should install version 4.14. This program is super handy, but if you decide to keep using it don't forget to pay your shareware fee.

From: Digital Workshop 01295 258 335

**WORD EXPRESS 2.0**

Need to type something? Here's a fully functional shareware word processor. It's a 32-bit version for Windows 95.

From: TP 01189 564601

**WINZIP 6.2**

We find this compression utility

absolutely essential for squeezing large files onto floppy disks and opening zip files downloaded from the Internet. For Windows 95.

From: Atlantic Coast 01297 552222

**WING**

An essential graphics driver for Windows 3.1.

**WIN32S**

Install this if you have Windows 3.1 and you'll be able to run 32-bit software.

**VIDEO FOR WINDOWS**

On the off chance that your PC doesn't support Video for Windows you can install it from our cover CD.

**PKZIP FOR WINDOWS**

In addition to *WinZip*, we bring you another file compression utility. *PKzip* is shareware, so register to continue using it.

From: PCWARE [www.pkware.com](http://www.pkware.com)

## Notes on using CD Review

If you're a Windows 95 user, just pop CD Review into your CD drive and our interface should load automatically. You'll have two options. If you click Explore CD your PC will load up Windows Explorer and you can look around the folders on the disc and load programs manually.

A friendlier way of browsing the disc is to click the Run Menu tab. Do so and our disclaimer will appear. If you

agree with the terms click Accept and you can see what delights are stored within the disc's Games, Works, Multimedia and Essentials sections.

Before attempting to actually install any software we recommend you close any applications, and read the entry regarding the software you wish to run in these disc pages. To install a program, just click on its name from

within our interface and follow any instructions or wizard prompts that may appear.

If you're a Windows 3.1 user, you'll have to run the file REVIEW.EXE manually using the Browse option from the Program Manager.

## TROUBLESHOOTER AND CONTACTING READER SUPPORT

If you're experiencing problems running one of the demos on CD Review firstly read the corresponding entry in these disc pages, as well as any README files that may accompany the software. Discs which won't run because they are physically damaged should be sent to PCR83, CD Returns, Disctronics, Southwater Business Park, Worthing Road, Southwater, West Sussex, RH13, 7YT. We will send you a replacement within 28 days.

**QuickTime and DirectX**

Two of the most common problems people have is that they do not have the latest versions of *DirectX* or *QuickTime* installed on their system. We have included these in the Essentials section of CD Review. QuickTime is required for many multimedia applications, while

DirectX is necessary for most games. If a program fails to run due to errors relating to either of these programs, uninstall the software, install DirectX or QuickTime, then try reinstalling the program or demo. It should now work.

Some PCs still do not support DirectX and if you experience a major problem after installing it we recommend you shut down your PC and restore your original Windows 95 graphics drivers. To do this restart, and hold down [F8] as the machine boots up. Select Safe Mode from the menu. Insert the CD Review disc and run the file DXSETUP.EXE which you'll find in the folder D:\ESSENT\DIRECTX. (D: refers to the letter of your CD drive.) Double click the file and select Restore Windows 95 Drivers to return to your original setup.

**CONTACTING READER SUPPORT**

Before contacting Reader Support, please click on the Troubleshooting tab from the CD Review menu. Fill in the form and save it as a text file or print it out. Our technical experts prefer to take queries as emails and will respond very quickly. The email address is:

[support@futurenet.co.uk](mailto:support@futurenet.co.uk)

Be sure to tell them you're using CD Review, and enclose our Troubleshooting form in your email. Alternatively ask for Technical Support on: 01225 442244

Have your Troubleshooting form ready as it will speed up the process. We also take queries by fax on:

01225 732279

Again, we'd prefer it if you sent us your completed Troubleshooting form.



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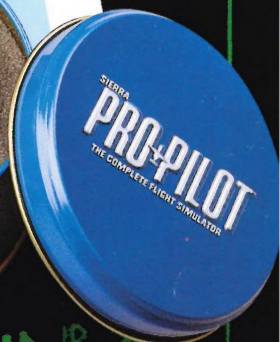
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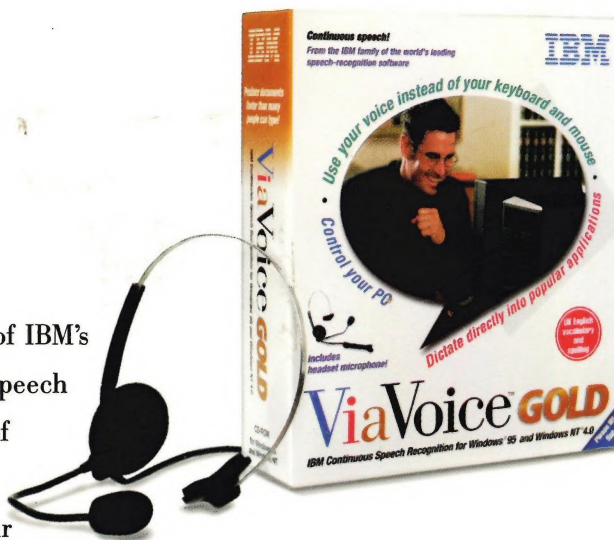
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